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Editorial and Executive Offices

239 WEST 39TH STREET, NEW YORK, N. Y.



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Member, Audit Bureau of Circulations
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Indexed in the Industrial Arts Index.
Published every Thursday. Subscription
Price: United States and Possessions,
Mexico, Cuba, \$6.00; Canada, \$8.50;
Foreign \$12.00 a year. Single copy, 25 cents.
Cable Address, "Ironage, N. Y."

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THE IRON AGE

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RYERSON STEEL-SERVICE

THE IRON AGE

MAY 13, 1937

ESTABLISHED 1855

Vol. 139, No. 19

Machine Tools an Important Factor In Prosperity

By CLAYTON R. BURT
*President, National Machine Tool
Builders' Association*



CLAYTON R. BURT

THE white light of publicity is turned full upon all manufacturing enterprise. Every act of every business administrator is dissected under the microscope of political expediency, in the seeming hope of finding some unworthy motive hidden in it. There are as many interpretations placed upon isolated facts as there are commentators.

When our country was in the throes of a severe depression it was understandable that there should be some attempt to fix a cause. Reform always is popular when the public spirits are low. Even punitive reform gives some comfort to a harassed people, so far as it en-

ables them to place blame for the disaster upon someone else.

But now recovery is accomplished; the reform legislation is on the statute books, and still the hurling of epithets goes on. The harangue against bankers and managers of public utilities and railroads having worn a bit thin, the manufacturers of durable goods appear to be next in line for a belaboring at the hands of politicians hot upon the trail of personal power. At a time when every plant is operating to capacity, all the ills of humanity, en masse, are laid at our doors; the present unrest of labor, the sit-down strikes, too low wages, too long hours, too high prices, the

pinch of rising living costs, inadequate tax returns, and the unbalanced national budget. We see the ire of innocent people stirred up against the group of industries that is fundamental to recovery and prosperity.

It would be presumptuous for us as machine tool builders to speak for related industries, but we can lay bare the facts with regard to our own group, as one division, and the basic one among the durable goods industries.

The machine tool industry came through the most severe depression of which we have record with its capital reduced by more than 40

per cent ⁽¹⁾; representing expenditures in excess of income due to the costs of holding together the nucleus of each organization through five terribly lean years, during which most of the overhead costs, such as taxes, insurance, development and the variety of money contributions our plants make to their respective communities, all had to come out of previously earned reserves.

Hundreds of thousands of dollars out of our reserves were spent for research and development work so that we might redesign our machines to handle new materials to better advantage, work to closer limits of accuracy, and better manufacture the new products created to coax back an unwilling market. More thousands were invested in training men. As the outlook slowly improved, we returned men to their old jobs, rebuilt their former skill, and trained new ones to replace those that death, disability, and transfers to other jobs had lost to the industry. A working force of skilled engineers, machinists and operators was rebuilt from a minimum of 16,000 men in January, 1934, ⁽²⁾ to an estimated 60,000 at the present time. For a small industry such as ours that is a real feat. Average weekly earnings of our workmen, including all types of labor, according to the Department of Labor figures, increased from \$21 in January, 1934, to \$30.74 by January of this year. Since then they have increased further.

We have a reputation for fair dealing with our men, and have had them share in the progress of our industry as the demand for our product has grown.

We have a reputation for fair dealing with our customers, treating all alike with respect to engineering service and prices for our product.

We have cooperated with our customers to provide the best possible aids to better production, to the end that they might pay higher wages to their employees without being forced to narrow their markets for their own goods through excessively high prices.

Before the 35th spring convention, Edgewater Beach Hotel, Chicago, May 3-4.

⁽¹⁾ Based on a cross section study of 40 representative companies.

⁽²⁾ Department of Labor Statistics.

⁽³⁾ Estimate for June 30, 1937 — National Industrial Conference Board.

⁽⁴⁾ Estimate for June 30, 1937 — National Industrial Conference Board.



We have never ceased to provide our Government with the necessary equipment upon which our national defense rests, even though this has meant meeting the higher costs of the Walsh-Healey requirements, which demand payment of time and a half for all work over an 8-hr. day and a 40-hr. week, and the keeping of costly detailed records.

We have maintained our interest in the welfare of our various communities, contributing heavily to their support through taxes and service expenditures, also taking an active interest in the education of the young people who lean toward technical careers. Wherever there are machine tool plants there you will find the best equipped trade and technical schools and cooperative colleges. Our industry has led the procession in establishing sound training courses for young men to supplement their school work.

Such is our record; a sound and constructive one of which we are proud, and of which our men are proud; a record which over many, many years has won the respect of our customers—and our customers take in the whole broad group of metal working, durable goods industries.

Mechanization Brings More and More Employment

Machine tool builders are committed to the principle of "more goods for more people" as a means of creating full employment for all

who honestly want to work. The records of past achievements in this country prove that this principle is sound. Increased mechanization, made possible by constantly improving machine tools to fit more and more exacting tasks, has brought to the consumer a wealth of goods and services little known 50 years ago. Mechanization is constantly creating more and more employment as it brings into being new industries that make the world a better place to live in. A number, even now in their infancy, have possibilities for growth and employment far more extensive than we realize. I refer to air transportation, to radio communication, to television, to air conditioning, as but a few examples of newcomers that tomorrow will rank with the largest of our enterprises.

We take no credit for the genius of invention that brought these new facilities into being, but we do justly deserve the credit for making it possible to produce them in sufficient quantities and at low enough prices to place them within the reach of the great mass of our people.

Indeed, we go much farther than that statement, to say that the prosperity of the country rests squarely upon the maintenance of a sound and prosperous machine tool industry. Any restrictions, economic or political, that divert the attention of the machine tool builder from his primary function of designing and supplying needed industrial equipment is a drag upon progress.

The term prosperity implies more than a climbing index number of production, or a rising curve on a piece of white cardboard. Prosperity is a condition of well-being of all the people. In our money economy it has to do with the peoples' income from any source, and particularly with what goods and services that income will buy. An era of prosperity is one in which all the people have opportunity to provide for their families adequate food,





clothing, shelter and surplus comforts to accord with their station or their diligence.

Prosperity Reaches New Heights in Every Business Cycle

The measure of prosperity is an ever-expanding thing. It reaches into new heights with every advance in a business cycle, holding its gains through the decline, to make a fresh starting point when the next upswing begins again. This accords with an idea of progress born of a century of amazing advances in power generation and transmission, phenomenal improvement in the machinery of production, transportation, communication and sanitation, and extended uses of scientific instruments—all dependent upon machine tools to bring them into being or to place them at the disposal of the people.

Today's idea of prosperity is not built upon the experience of a long depression, as one might expect, but finds its base in the highest standard of living attained in the boom twenties. To be really prosperous it is confidently expected that production, distribution, and all the opportunities for better and more abundant living shall more than equal—shall exceed the achievements of the last boom.

A considerable recovery has been accomplished, due in part to the natural replacement demands after five years of stagnant business, in part to Government spending, and in part—a larger part than most people think—to a heavy European demand for defensive re-armament. So far have we come that there is question whether a temporary top has not been reached, and that some recession of indeterminate duration may not now be due. This point, then, is a good one from which to take bearings.

Without going into detail, we observe that the indexes of manufacturing production are within one point ⁽¹⁾ of the 1929 average. Employment is within 5 per cent of the 1929 average. Average hourly

wages are considerably above 1929. Weekly earnings, in spite of shortened working weeks, are in most industries as high as 1929 and their purchasing power is higher. In the results to date everybody has shared; the wage and salary earners in increased income; the stockholder in a return of dividends; the Government in enormously higher tax collections; and the consumer in more and better goods for his money.

Against these gains appear, as dead weight upon immediate further progress, the enormously increased costs of Federal, state and local governments, the cost of maintaining extended relief programs, the cost of social security; all these reflected in taxes; a Federal deficit of \$35,000,000,000, ⁽²⁾ foreshadowing still higher taxation; labor unrest, particularly fomented strikes which cost the workmen millions in lost wages and assessments.

Cost of Planned Economy Still to Be Paid for

It has happened many times in the past, as it is happening now, that impatience with the ordered advance has led to attempts to force progress along certain lines by creating a so-called planned economy. The planning always is to be done by self-appointed groups, usually political, ostensibly in the interest of the people, but almost invariably ending in special privi-



lege to a few and an actual diminution of benefits to the many. The present Governmental efforts to control industry and agriculture, which have for their aim the equalization of wealth regardless of individual effort or contribution, differ only in detail from many others that have gone before. In the long run a great many of the ambitious plans that are being carried on regardless of budgetary bounds will fail, will be brushed aside, and eventually forgotten. A few may prove worthwhile, and those we hope may be lasting. The cost of the whole experiment, however, remains still to be paid for.

If we are to go forward on our way to the prosperity that is in the minds of the people, these additional expenses must somehow be met out of the full employment of industrial facilities and man power in the production and distribution of new goods, and they can be met only if production is stepped up to a faster rate than has heretofore been possible. It will be necessary more than ever to maintain a sufficient spread between production cost and selling price to take care of all imposed costs above enumerated; and at the same time industry must create and be permitted to lay aside sufficient reserves to assure its own survival.

The last two years have witnessed a great forward movement to rehabilitate the equipment of our manufacturing departments in line with the obvious need for greater efficiency. But there still rests upon metalworking plants a staggering burden of obsolescence. Outmoded equipment cannot increase production enough to bring down unit costs to the point to which they must come if prices of finished products are to remain within consumer ability to buy. We need to put more machines to work, and to train more operators to man them efficiently.

Political Controversies Blind Us to Industrial Progress

Our political controversies have engaged our attention, willy nilly, to the point that we have become blinded to the possibilities that lie ahead. On every side are industries struggling with new materials, new methods, new systems of production. Their problem now is one of costs, and as has been the case with every new development, when through proper equipment of one

(CONTINUED ON PAGE 146)

A Metal Cutting Test Method

FUNDAMENTAL problems relating to specific operations are constantly arising in machine shops of all types. It may be desirable, and even urgently necessary, for example, to determine the machinability of a particular metal to be cut, the effect of changes in tool material, heat treatment and tool

shape, the kind and quantity of cutting fluid to use, or the cutting speeds that will give maximum between-grind tool life and the best overall operating economy. A method of making such investigations with equipment found in any shop is presented in this copyrighted article by Mr. Deale.

o o o

EXPERIMENTS on the cutting of metals may be carried on with several different purposes in mind:

- 1—To determine the values and directions of the forces set up by the

removal of a chip with a cutting tool.

- 2—To investigate the action of the metal being removed as a chip, and its effect on a tool, in an effort to determine

a scientific basis for the phenomena observed in the cutting of metals.

- 3—To determine the effect of changes in tool material, heat treatment, tool shape, chip proportions, kind and quantity of cutting fluid, machinability of the metal cut, and the life of the tool between grinds on the cutting speed which may be used in general machine shop operation.

Experiments which have as their object the determination of the values and directions of the pressures set up in the cutting operation have a value in producing data which may be used in the design of machine tools and the cutting tools used in them. Such data, however, are of little interest to the operating executive, who must make use of the equipment already in his shop or which is available on the market. Seldom does he interest himself in an analysis of the stresses governing the design of a machine tool. Unfortunately, pressure experiments have been given a disproportionate amount of attention by investigators in this field. Many qualified investigators who might otherwise be interested have believed that it was impossible for them to do any valuable experimental work because of their lack of dynamometers and other special equipment.

Comparatively little work of real value has been done in determining the scientific basis underlying the cutting of metals. It is highly desirable that this field be thoroughly investigated, but such work must

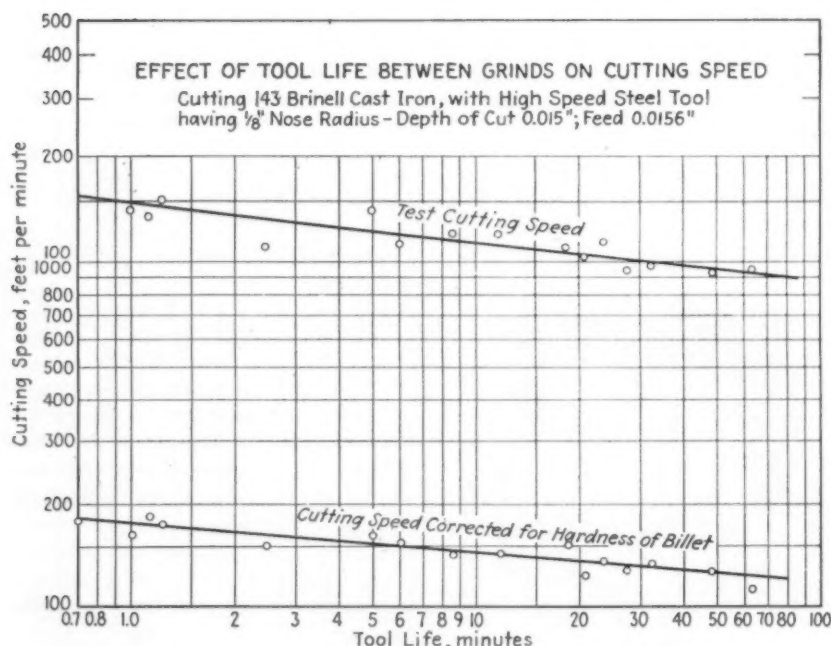


FIG. 2—Graph showing application of a method devised to compensate for variations in machinability of a test billet.

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be done in the laboratory by a well-trained investigator, who must devise his own methods and equipment as he proceeds with the work. It is not possible to lay out in advance a definite method of procedure for such work.

Only those tests coming under the third heading produce data of immediate value in the operation of a machine shop. They may be carried out with equipment found in any well-equipped shop, as they do not require the use of special laboratory instruments. As it is frequently necessary for a production executive to run such tests to determine the effect of changes in tool material, or the like, he should know the manner in which they should be conducted in order to secure data having the greatest possible usefulness. This brief paper has been prepared in an attempt to outline the methods by which valu-

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ican Society of Mechanical Engineers*

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able data may be obtained as economically as possible.

Metal cutting experiments should follow the true scientific method, in which the effect of a single variable is investigated at a time, all others being held as constant as possible. While it is not always possible to adhere strictly to such a procedure, it is frequently possible to determine the extent of any variations which can not be controlled, and to make corrections for them which tend to eliminate the effect of such variations.

The principal variables in a metal cutting test are as follows:

- I.—Cutting Speed
- II.—Life of Tool Between Grinds
- III.—Tool Material
- IV.—Heat Treatment of Tool (if steel)
 - 1.—Preheat
 - a.—Temperature
 - b.—Duration
 - 2.—Hardening
 - a.—Temperature
 - b.—Time at Temperature
 - c.—Type of Furnace Used
 - d.—Atmosphere in Furnace Chamber
 - 3.—Quenching
 - a.—Medium
 - b.—Procedure
 - 4.—Tempering (or Second Heat Treatment)
 - a.—Temperature Used for First Tempering
 - b.—Time at First Tempering Heat

[illegible]

FIG. 1—Form of notes for metal cutting experiments.

- c.—Method of Cooling
- d.—Temperature of Succeeding Tempering Operations
- e.—Time at Succeeding Tempering Operations
- V.—Tool Size and Shape
 - 1.—Size
 - 2.—Contour
 - 3.—Tool Angles
 - a.—Side Rake
 - b.—Back Rake
 - c.—Relief
 - 4.—Angles Between Tool and Work
 - a.—Setting Angle
 - b.—Tool Holder Angle
- VI.—Chip Proportions
 - 1.—Depth of Cut
 - 2.—Feed
- VII.—Cutting Fluid
 - 1.—Kind
 - 2.—Quantity
 - 3.—Method of Application to Tool
- VIII.—Material Cut
 - 1.—General Type (as Steel, Brass, Aluminum, etc.)
 - 2.—Method of Manufacture (Wrought, Cast, etc.)
 - 3.—Physical Properties

Such data as are available indicate that it is not possible to determine general relationships between the results which may be obtained with two dissimilar tool materials, as a high-speed steel and tungsten carbide. It is possible, however, to determine such relationships between similar materials, a tool steel which permits a given increase in cutting speed over another under one set of conditions apparently being capable of a similar increase under any other set of conditions. A comparison made with dissimilar tool materials is valid only for the conditions obtaining during that particular test.

The same is found to be true when cutting dissimilar materials, such as steel and brass, with tools made of the same material.

Some modification of the breakdown test devised by Frederick W. Taylor should be used in running a test designed to obtain data usable in the shop. In such a test, the cutting speed is maintained at a value which will cause breakdown of the tool in a relatively short time, preferably not less than five nor more than 20 minutes. A fixed life is difficult to obtain experimentally, and any attempt to hold tests on a fixed life basis tends to increase the cost of carrying on a given set of experiments, with-

out corresponding increase in accuracy of the results. Taylor determined that, under constant cutting conditions, the relationship between cutting speed and tool life followed the law

$VM^n = a \text{ constant}$ (Formula 1)
where

V = Cutting Speed, measured on the uncut surface of the work, ahead of the tool (in ft. per min., or meters per min.)

M = Tool life between grinds, in minutes

n = A constant, determined experimentally. The values for n determined from the best available experimental data are given in Table I.

TABLE I—Values of Exponent 'n,' for Use in Formula 1

Tool Material and Metal Cut	Chip Thickness	
	Less Than 0.015 In.	Greater Than 0.015 In.
Carbon Steel:		
Steel	0.075	0.200
Cast iron	0.075	0.075
High Speed Steel:		
Steel	0.100	0.125
Cast iron	0.100	0.100
Brass or bronze	0.290	0.290
Stellite:		
Steel	0.140	0.180
Cast iron	0.140	0.140
Cemented Carbide:		
Steel	0.130	0.160
Cast iron	0.130	0.130

When a tool fails while cutting steel, there is little doubt as to the point at which failure occurs, as the breaking down of the cutting edge causes a burnishing of the cut surface which can be detected at once. If the machine is not stopped immediately, the tool will be completely ruined, even to the melting away of the entire tool nose. The same effect may be observed when taking light cuts on cast iron. The end point, when taking heavy cuts on cast iron is somewhat difficult to determine, although experience makes it possible to determine when a cut should be stopped.

After failure of a test tool, a different tool should be used to remove any trace of surface irregularity from the log, as well as the surface burnished by the failed cutting edge. This burnished surface will be found to be considerably harder than that portion of the log which has been cut cleanly.

Before starting a cut at a smaller diameter of the test log, a light finishing cut should be taken over the entire length of the log,

in order to remove any irregularities of the surface, and make certain that succeeding cuts will have a constant depth.

The form shown in Fig. 1 is suggested for use in recording metal cutting experimental work.

CUTTING SPEED.—The cutting speed may be measured either by a cutmeter, riding on the surface of the billet, ahead of the cut, or may be calculated from the diameter of the work and the speed, measured in revolutions per minute. Care should be taken to assure that belt slippage, or voltage variations are not allowed to affect the constancy of the cutting speed used for any test point. The variation in cutting speed should not exceed 2 per cent, and preferably should be much less. Where possible, it is desirable to use an adjustable-speed direct current electric motor to drive the lathe used for the test, so that any desired cutting speed may be secured, through a combination of gear changes and rheostatic control of the motor speed.

The cutmeter used to measure cutting speed should be calibrated, so that the cutting speeds read in the course of the experimental work may be reduced to true speeds, before final analysis of the results.

TOOL LIFE UNDER CUT.—When the cutting speed is so adjusted that the tool life under cut falls within a relatively narrow range, Formula 1 may be used to calculate the cutting speed at any tool life which has been adopted as standard, without appreciable error. It has been found that a life under cut of 10 min. gives very satisfactory results. Too short tool lives tend to introduce serious inaccuracies, because of the large effect which a small experimental error has on the results. A long tool life, while giving satisfactory results, increases the cost of the experimental work, both by increasing the time required to carry on the work, and by increasing the quantity of billet material which must be used in obtaining a given number of test points.

The tool life under cut can be measured with a stop watch, preferably one having a face graduated in minutes and hundredths, with an entirely satisfactory degree of accuracy.

TOOL MATERIAL.—For all tests except those having as an

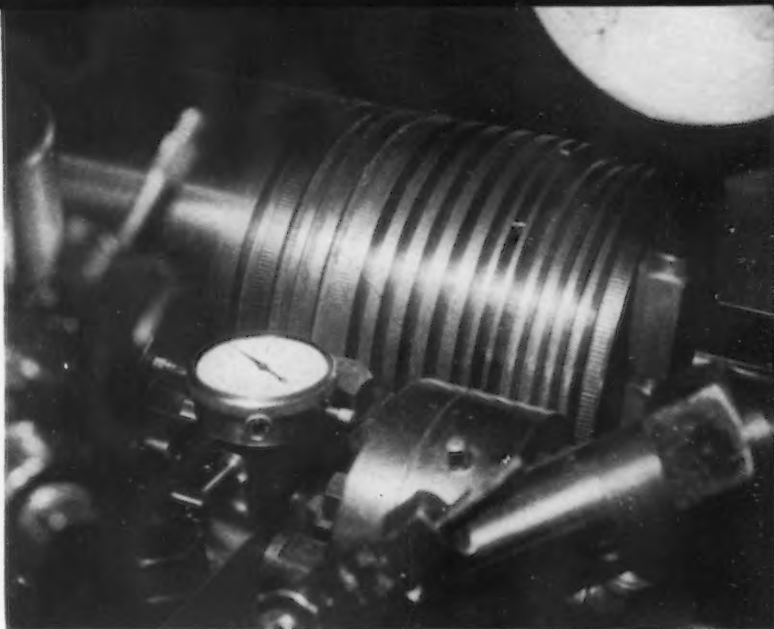
object the determination of the relative effectiveness of two or more tool materials, the tools should be as nearly identical in composition and heat treatment as possible. As it is usually desirable to use from four to six different tools in an extensive test, they should be taken from a single bar in such cases. Where the object is to determine the relative effectiveness of two or more tool materials, the tools should be so chosen as to measure as far as possible the probable commercial variation, by taking each tool from a different lot, or at least a different bar, of tool material. Each tool should be numbered, and the number of the tool used for each test point recorded in the record kept of the experiment. It is desirable to mark tools by etching rather than by stamping. A hardened steel tool tends to break through a number stamped before hardening.

HEAT TREATMENT.—Particular care must be taken with the heat treatment of steel tools used in a cutting test to insure not only that they are hardened uniformly, but that they are hardened throughout. Many hardeners consider that a tool has been heated a proper length of time at the hardening temperature when it commences to "sweat." All too frequently such a treatment gives a hardness which decreases with increasing distance from the surface, with the result that the tool loses in cutting effectiveness with each grind. It should be possible to harden a tool so that its hardness is reasonably constant throughout its section, although one experimenter went to the extent of rehardening the tools used each time that they were ground. This tendency toward lack of uniformity in hardening decreases as tool size decreases, so that it is desirable to use the smallest tools that are practicable for the size of cut to be taken, well supported by shims to prevent deflection and breakage.

When experiments have as their object the determination of the effect of variations in the heat treatment used on cutting effectiveness, it is particularly necessary to make certain that all factors are kept under close control, including the atmosphere of the furnace chamber, and the time that the tool is kept at each temperature.

TOOL SIZE AND SHAPE.—Best available data indicates that

TESTS discussed in this article may be made with ordinary shop equipment. Other lines of experimenting, however, call for special devices. The lathe here shown, developed at the Massachusetts Institute of Technology, is equipped with three dynamometers for investigating the effect of size of chip on normal, radial and longitudinal components of chip pressure.



tool size has no effect on the cutting speed which may be used, provided the tool is supported in a manner which prevents excessive vibration or breakage.

The shape of the tool is of much greater importance than generally realized, and must be held to the desired contour and angle with as small a variation as possible. An accurate record should be kept, not only of the exact shape of tool used for each test point, but also of its own angles, and the angles between the cutting surfaces of the tool, and the surface cut.

CHIP PROPORTIONS.—Depth of cut and feed should be recorded for each test, and should be held constant throughout a given test run. At times there is a tendency for a tool to push away from the work, so that the depth of cut decreases as the test proceeds. This tends to give inaccurate results, and should be reduced as much as possible through better support of the work and firm clamping of the tool. There is little tendency toward variation in feed when the machine tool has a geared feeding mechanism, as is generally the case with modern machine tools.

CUTTING FLUID.—It is advisable to run all cutting tests dry, unless they have as an object the determination of the effect of a cutting fluid on cutting speed, or the quality of the machined surface. Use of a cutting fluid introduces the additional variables of the kind of cutting fluid, the quantity used, and the way in which it is delivered at the point of cut. A cutting test using fluid not only has these additional variables which

must be controlled, but also requires the use of a greater quantity of metal for a given length of run.

There is some evidence that in a very short test some of the cutting oils break down under the extreme heat generated at the nose of the tools. For this reason, when using an oil as a cutting fluid, it is desirable to increase the tool life between grinds to at least 20 min. to insure that no error is introduced into the test results by this phenomenon.

MATERIAL CUT.—Care should be taken to avoid, as far as possible, any variations in machinability of the test billet throughout its section which may affect the accuracy of the test data. Unfortunately, it is at times necessary to use billets which vary as much as 30 to 50 per cent in machinability, so that some method is necessary for determining the extent of this variation, and compensating for it so that the true effect of the variable being investigated may be determined.

The most accurate method is to interpose a control cut at a fixed depth and feed, with a tool which has been carefully standardized as to composition, heat treatment and contour, between each test cut. The data thus secured, reduced to cutting speeds at a constant tool life, may be used as a measure of the machinability of the billet. A graph may be made showing the variation in machinability throughout the section of the test billet. This may be used to reduce the data obtained from the test cuts to a uniform basis, by eliminating variations in

(CONTINUED ON PAGE 114)

Machining of

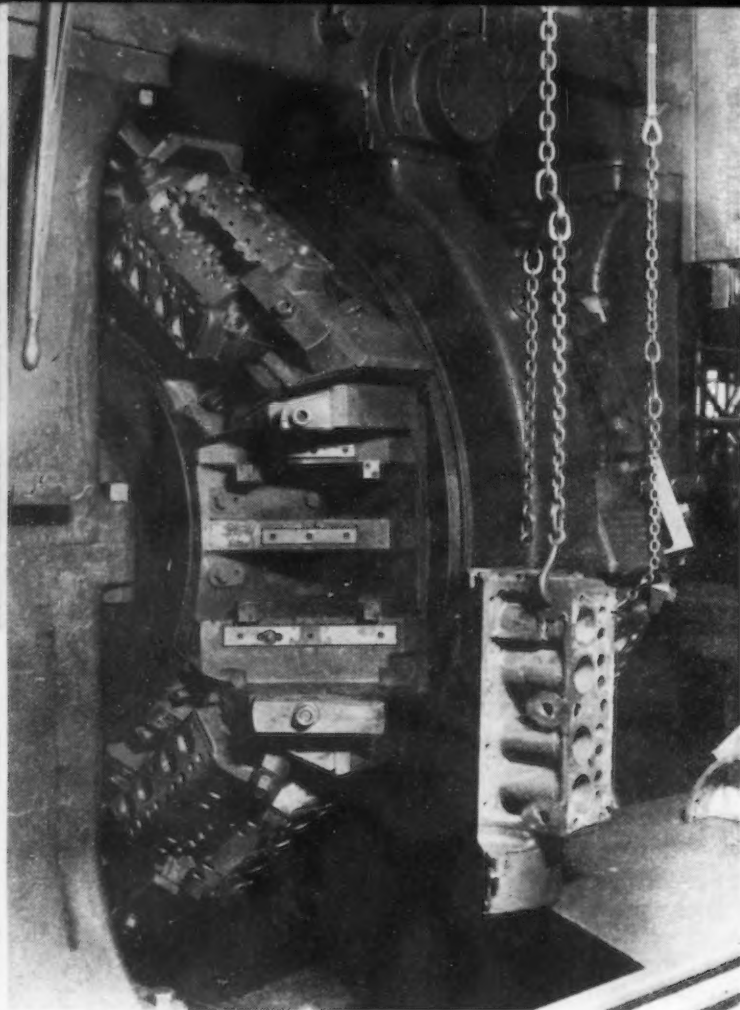


FIG. 1—Drum-type millers are still popular at the Rouge plant for machining large flat surfaces. In this unit the face of each bank is being milled in two set-ups. Eight locating lugs, broached in the first operation on the rough block, are first broken off by hand chisel before the block is clamped by wrench in the drum fixture. The counter-weighted handling slings, suspended from a jib crane, are a great help to the operator.

By FRANK J. OLIVER

Associate Editor, *The Iron Age*



WHILE in general the machining operations on the Ford 60-hp. V-8 engine do not vary materially from those employed on the larger 85-hp. engine (*THE IRON AGE*, June 2 and July 28, 1932), nevertheless details of the equipment do vary considerably. Advantage has been taken of machine tool developments in the intervening years between tooling for the original V-8 engine and the smaller optional block introduced in the 1937 line of cars. While many of these improvements were made by the machinery builders, a great deal of the initiative for these advances came from the Ford Motor Company's own special machinery division.

No attempt is made to describe every operation on the block, and only the more interesting set-ups are illustrated. The first operation is to broach four locating lugs on each bank in a tunnel-type machine. The broached lugs are used as contact faces when milling the bottom; however, the cylinder block rests on the bottom milled face when machining the top face of the block. The lugs are the locating points when the six main bearing studs are drilled from the bottom, along with two locating holes in the pan rail. Endwise locating is by four buttons on fixture engaging the cylinder bores.

As in the example of the large block, the drills are stationary and the work fixture descends upon them. The two locating holes similarly are reamed from the bottom, the block being positioned from

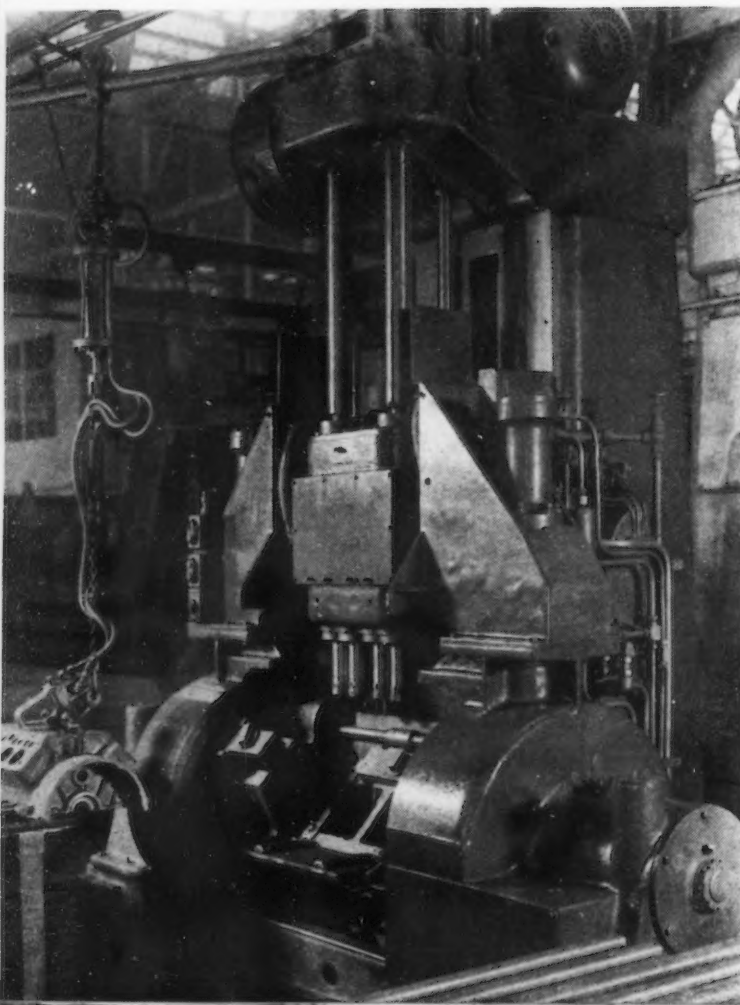
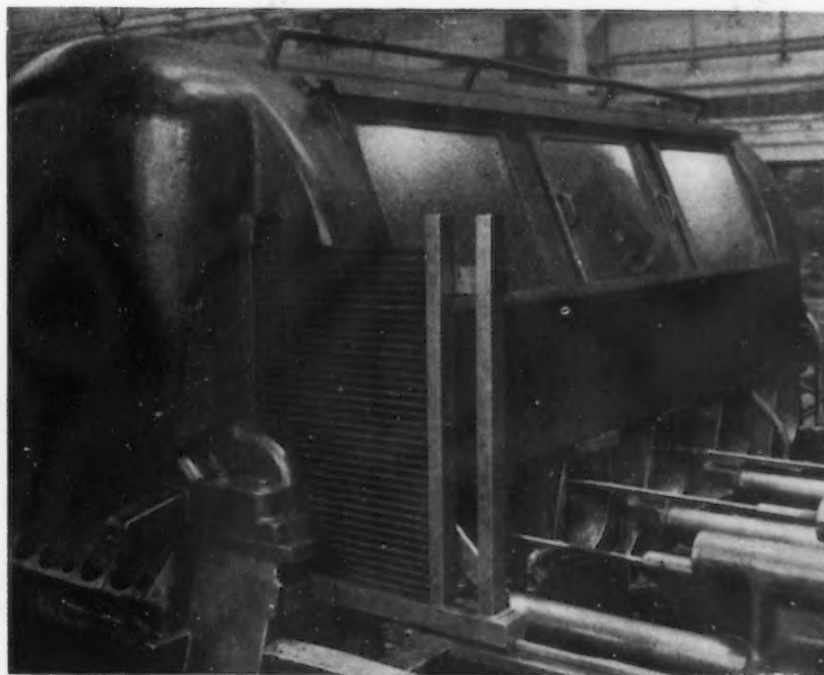
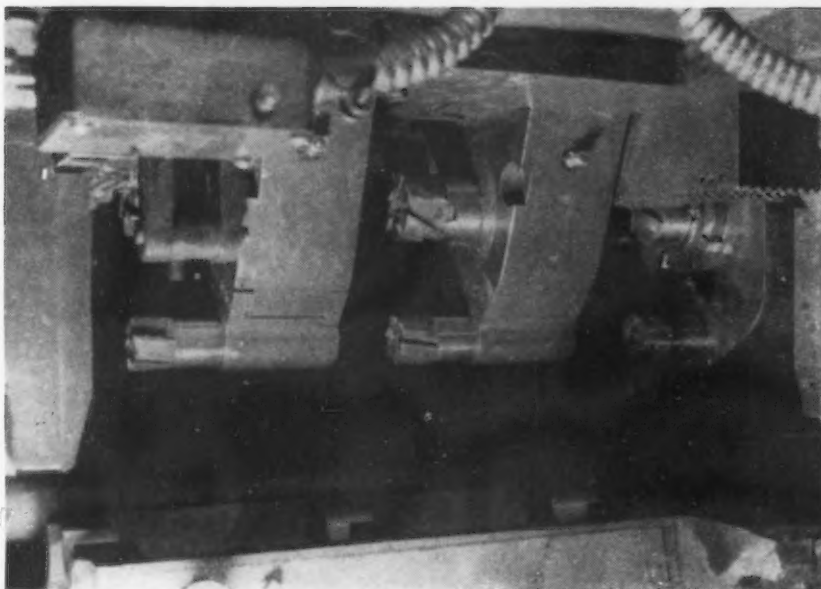


FIG. 2—After the scale is removed on all flat surfaces, the cylinder bores are roughed out, one bank at a time. The block is clamped by hand in a cradle-type fixture which is moved axially 0.7 in. when it is rotated 90 deg. for the second bank. This movement is hydraulically actuated. Stellite blades in cutters are used and limits are 0.002 in. endways and 0.003 in. sideways on location of bores.

the Ford 60-Hp. V-8 Engine

FIG. 3—Close-up of core drills on stud spindles of cam and crank boring machinery. There are three sections of the machine and the work is conveyed from station to station and clamped automatically: Oper. 1—Rough bore cam holes and half main bearings; Oper. 2—Semi-finish same bores; Oper. 3—Finish bore. Tolerances: 0.001 in. on location from bottom of block; 0.00025 in. on out-of-round; 0.0005 in. on size.

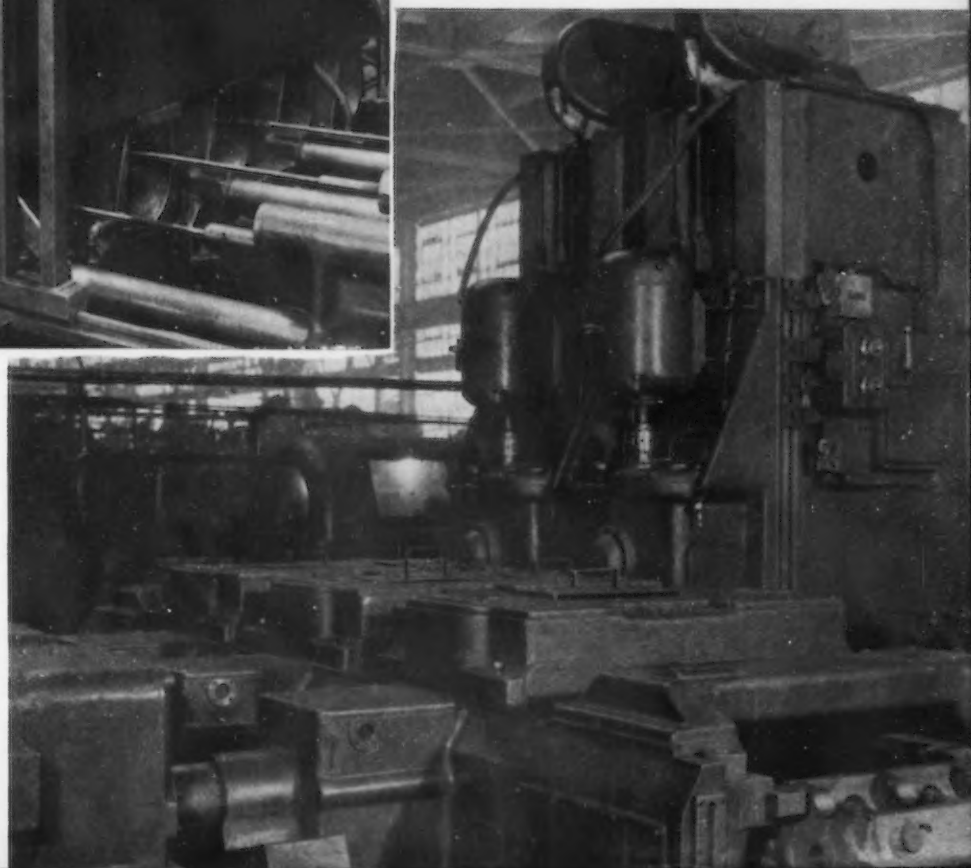


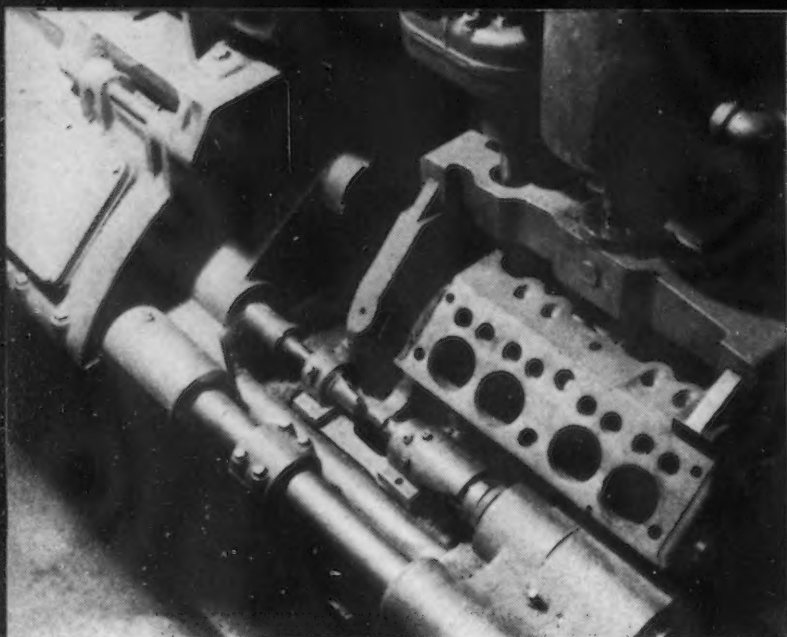
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FIG. 4—Under this glass hood, an oil line hole is drilled the length of the block in three steps. It is then reamed and a steel tube pressed in place. The block is located and clamped hydraulically and is automatically indexed between each of the five work stations. From the magazine rack the oil tubes drop in front of a simple hydraulic push bar.

AT RIGHT

FIG. 5—Another fully hydraulic station-type machine. The two vertical heads rough and finish mill the oil seal groove in the half bearing at the flywheel end of block, while the horizontal head at the end counterbores the camshaft bearing. At the front end of the block the first two horizontal heads rough and finish the fit for the timing gear cover in relation to the camshaft bore, while the third head spots the camshaft boss within 0.001 in. of the front face through a hydraulic depth control. For this operation, wedge clamps relieve the locating pins of shear from the tool thrust. The block is elevated and clamped in the work position on four pins actuated through a roller cam plate and hydraulic plunger.





AT LEFT

FIG. 6—Motor support lugs are being spotted on each side and drilled successively in this special machine. After one side is spotted and the hole drilled, the carriage picks up and begins to rotate the second spot-facing tool through a simple clutch. The block is clamped hydraulically.

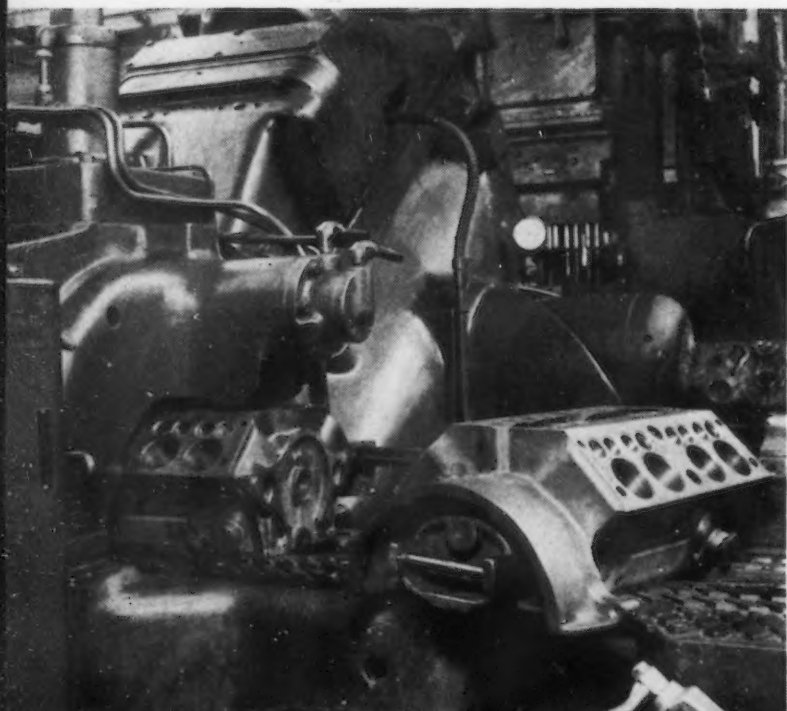
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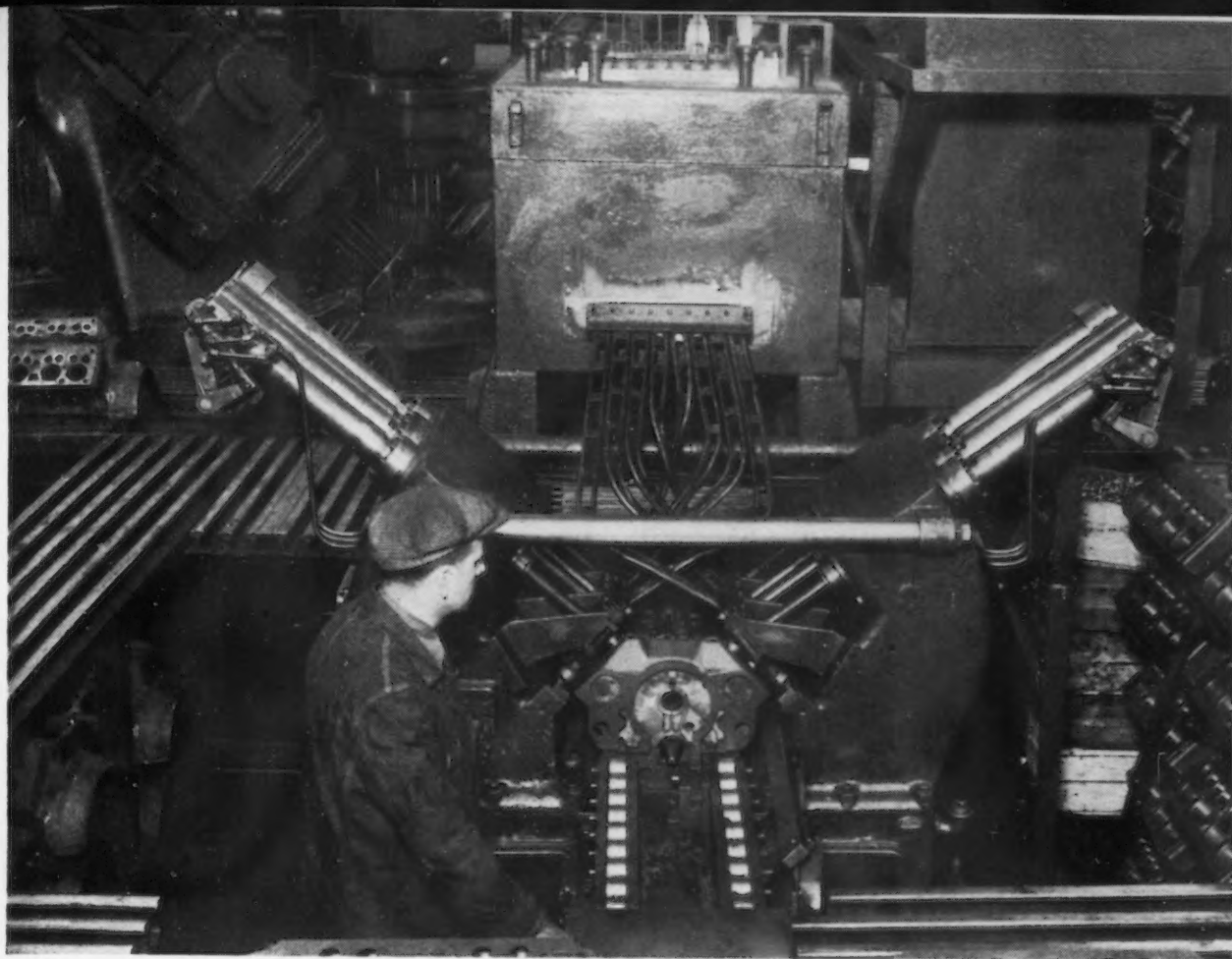
FIG. 8—Valve stem and push rod holes are semi-finish reamed in this V-type, fully hydraulic machine, which includes a pull bar that draws the block into the loading position. Reamers are guided by a pilot bar inserted through the camshaft hole as shown. The same bushing bar is also employed in the following set-up in which the valve holes are flycut for alignment in a machine with fixture similar to that shown in Fig. 2.



ABOVE

FIG. 7—Valve clearance and throats are machined in each bank on this eccentric head machine with electro-hydraulic control. The block is positioned by locating pins in the pan rail and is clamped on the top hydraulically. In addition, wedges are advanced hydraulically at a 30-deg. angle to catch the inside of the main bearing bosses and thus eliminate end motion. Each tool head, containing four spindles, is supported between two eccentric bars which impart a planetary motion to the tools. The eccentric method of cutting is used to eliminate an excessive tool pressure which would result from the use of tools contacting the entire area of the holes being machined. One bar has a fixed eccentricity, the other is adjustable through an eccentric sleeve, actuated by hand crank and lock plate. Each step in the plate of clutch corresponds to 0.012 in. on tool grind. The block is unclamped and shifted 1.4 in. axially to machine the second set of valve holes.





two of the stud holes. In the same set-up oil filler holes are core drilled.

Clamping is done by hand in the last two named operations, but in most succeeding ones hydraulic clamping is employed. In fact, in many units, particularly the horizontal station-type machines, the block is pulled into the machine and indexed from station to station or ejected hydraulically. The machines for straddle milling the three main bearings, for boring the cam and crankshaft bearing holes,

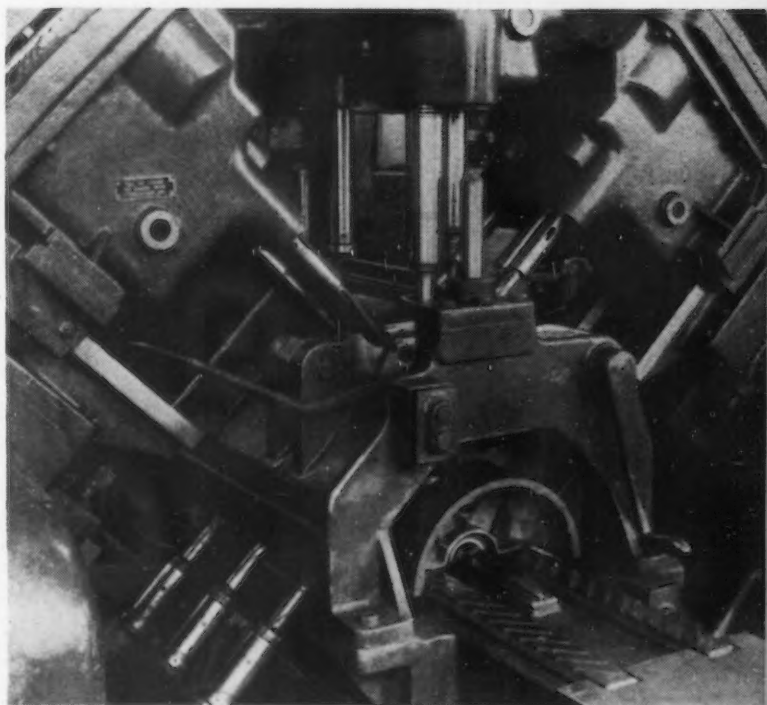
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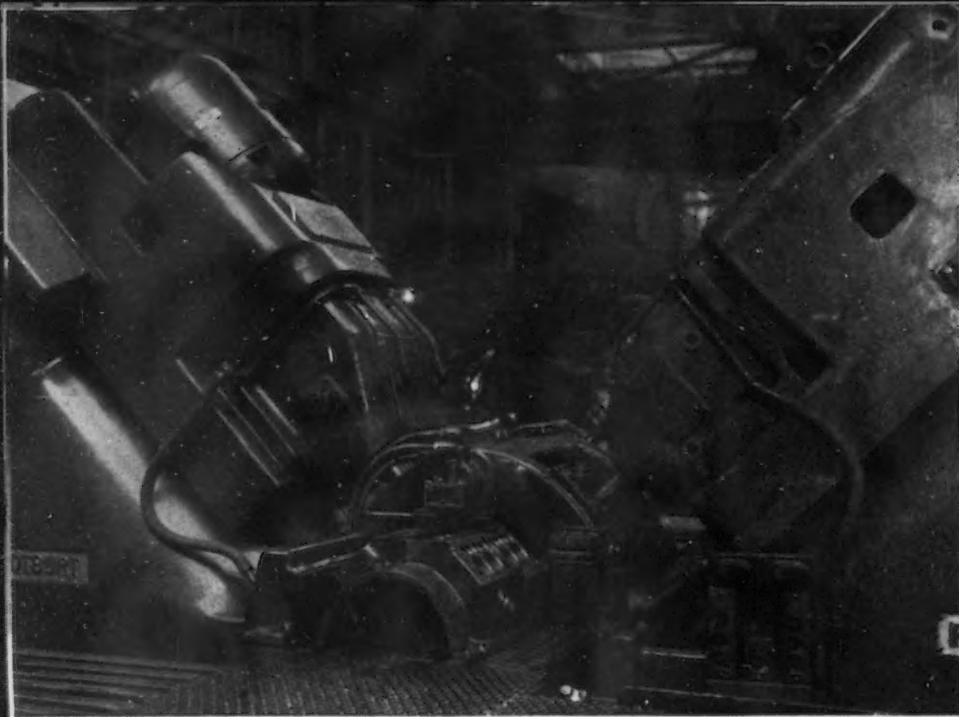
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FIG. 10—Practically surrounded. A battery of core drills at work on the intake and exhaust cores in the block. Because the paths of the two top angular drills cross, the head movements are synchronized so that as one withdraws, the other approaches the work. The block is located on dowel pins and clamped by the hand crank shown at the right.

ABOVE

FIG. 9—Eight exhaust valve seat inserts cooled to minus 320 deg. F. are fed to the block by open copper conduits from the liquid air refrigerator in the background. Inserted in the block by hydraulic rams they are given a percussion blow by spring hammers to drive them home. They are held in this position 5 sec. to allow them to expand. The springs are reloaded by power and the triggers are tripped hydraulically.

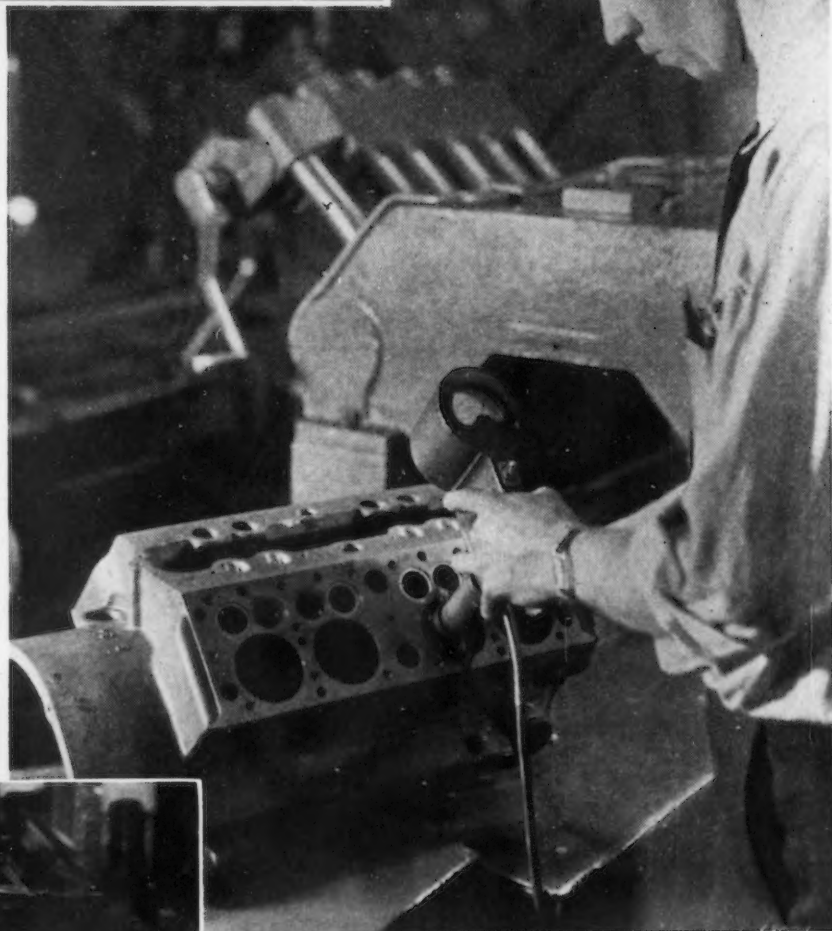




ABOVE

FIG. 12—To insure accuracy within 0.001 in. endways and sideways in semi-finishing the cylinder bores, both the heads and the bases are water cooled. Also the boring bars are supported on extended sleeves with the bearing at the lower end right next to the T-C cutters. Three taper gibs for height and side adjustment on the square-lock ways, which are 24 in. apart, are other factors contributing to precision. The head slide is 54 in. long. Head movement and clamping are hydraulically actuated.

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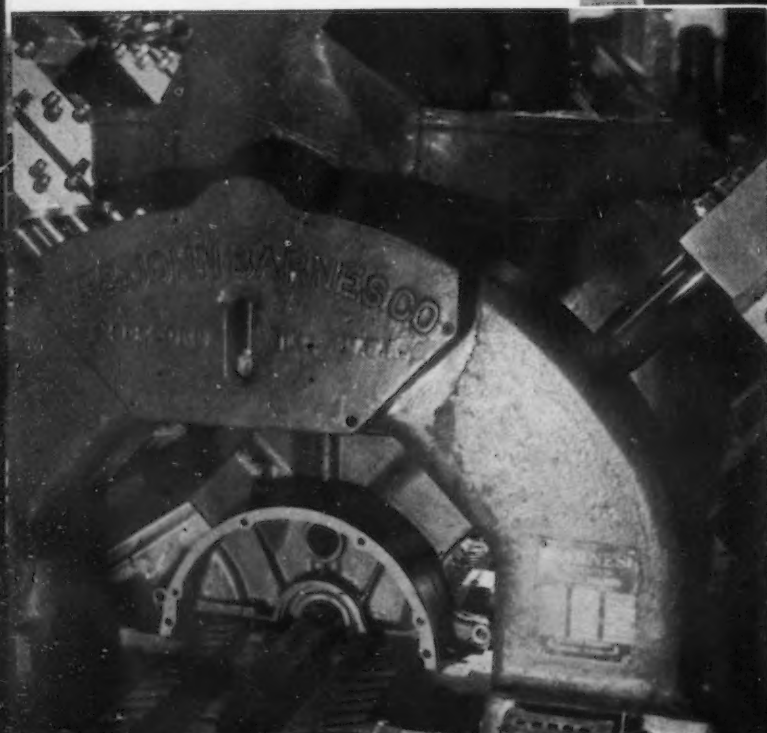
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FIG. 13—In the newer type single-point T-C precision boring machines, square-body spindles permit close enough center distances to finish all four holes in a bank simultaneously, in place of two. This machine has 16 spindles and two blocks are finished in each cycle. This operation is carried on in a room maintained at 72 deg. F. Feed, 0.006 in. per rev.; speed, 480 ft. per min. Tolerances: Taper and out-of-round, 0.0002 in.; size 0.001 in.

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BELOW

FIG. 14—Final operation is honing in a single set-up, using a combination of 400- and 320-grit stones in a hydraulically actuated machine. Then a percentage check on wall thickness is made with the magnetic gage shown. It operates on the principle that the thicker the iron, the more magnetic flux flows between two poles. The dial is calibrated in 64th of an inch and has the minimum allowable thickness marked thereon.



and for chamfering the top and bottom of the bores are examples. The units shown in Figs. 4, 5, 7, 8, 12 and 13 are others.

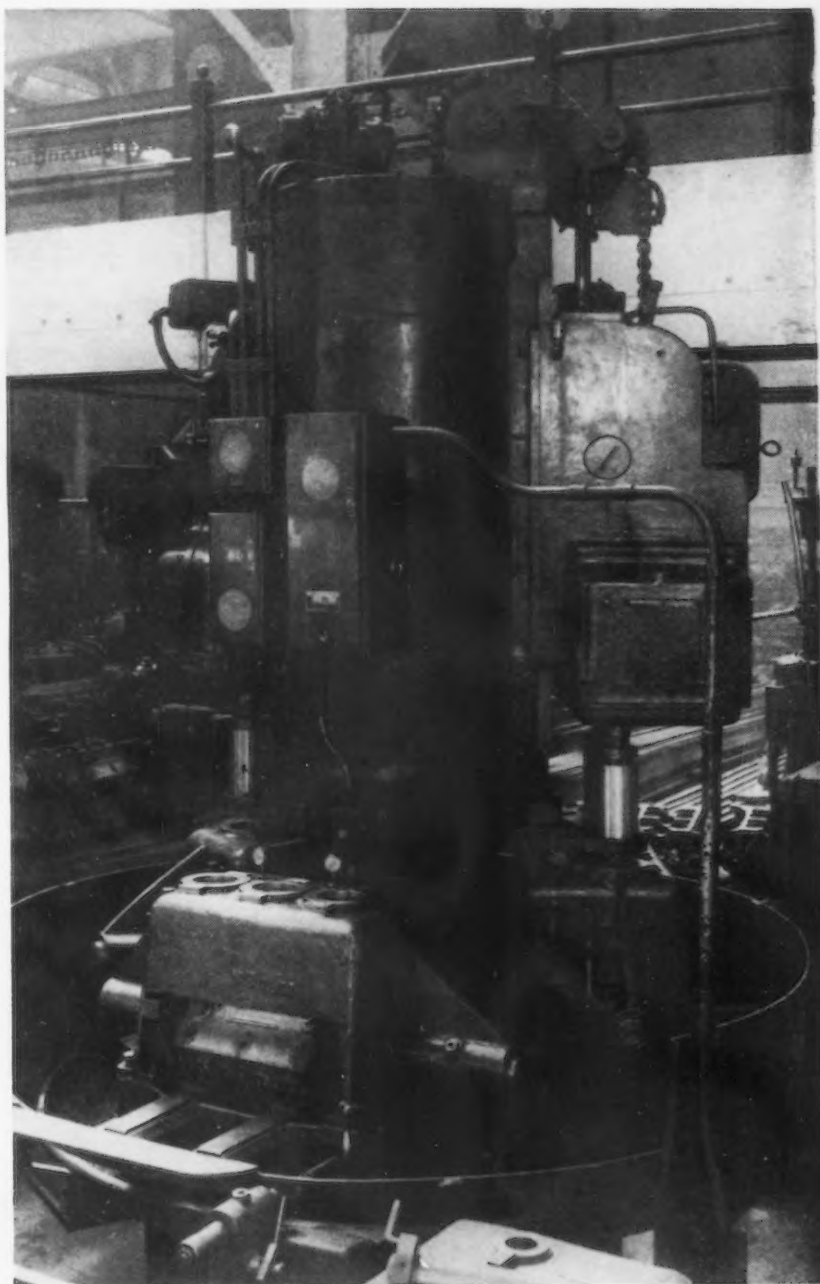
In several instances also, hydraulic clamping has been applied to checking fixtures. Obviously, however, such means are not employed in the milling operation pictured in Fig. 1, where simple L-clamps are tightened by nuts. Drum-type millers are used for all of the block faces; the two ends, top and bottom and cylinder head surfaces.

Machines for the small block are placed alongside those for the larger engine and common power conveyers carry both blocks indiscriminately. The conveyors, traveling in opposite directions, occupy what would ordinarily be the aisle space in the average plant. In many instances, railroad rails serve as transfer slides from conveyor to machine table, which is at conveyor height.

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FIG. 11—Charging station of center-column type machine for rough and finish grooving the bearing cap seats on the bottom of the block, while it is supported in an inverted position through two stud shafts engaging the camshaft bores. Dial indicator gages contact buttons extending through the box fixture and enable the operator to locate the block for height (and hence depth of cut) through pressure pads from below.



New Ceramic for Laboratory Table Tops

STUART M. PHELPS and **Edward E. Marbaker**, of Mellon Institute, have described the development of a new laboratory table-top material called Kemite. Its properties are such that it fulfills the exacting requirements of scientific laboratory service and does not have any of the disadvantages of the materials commonly used for this purpose.

Kemite consists essentially of an easily-moldable ceramic body into which has been incorporated car-

bonaceous substances to increase the porosity after firing. It also contains artificially-prepared cordierite, a mineral having an exceptionally low thermal expansion. This body, after molding, drying and firing, is completely impregnated under pressure with liquid bitumens, and then subjected to a heat treatment during which the volatile matter is expelled. A residue of carbon in the form of coke fills the pores, rendering the body dense and imparting to it an attractive black color. Kemite is smooth, hard, strong, practically impervious to liquids, and very resistant to the action of acids and alkalis. Because of its low

thermal expansion, when locally heated and cooled rapidly, it does not crack or spall. It retains its pleasing appearance under severe laboratory conditions.

While developed primarily as a table-top material, the characteristics of Kemite suggest its use in other kinds of laboratory and chemical plant equipment. In another form called "Karcite," in which cordierite is not present, it is being used for sinks, tanks, drain pipe, pipe fittings, and window sills. In building construction, it can be employed in such forms as sanitary ware, partitions, roofing, flooring, wainscoting, stair treads, and shelves.

Republic's New Wire Mill Includes



AN electro-galvanizing line, almost 500 ft. long, is a feature of Republic Steel Corp.'s new wire mill at South Chicago. This new mill reflects the ultimate in modern industrial design. Aisles and clearances between machines are spacious, permitting free movement of men and materials. Special attention has been paid to natural and artificial lighting; adequate ventilation is another feature; and, high-speed mechanical handling equipment permits speedy and efficient flow of raw materials, those in process, and finished products, which include plain and electrically zinc coated wire, barb wire, woven wire fence, poultry netting, nails and staples.

The rod yard has a capacity of 2800 gross tons, and is serviced by

a 96-ft. span, 5-ton, double tilting hook, high-speed crane. Steel racks for piling rod coils six high, on edge, in individual lanes are provided to facilitate storing, handling and classification of rods. A broad-side transfer conveyer, holding 13 rod lifts of 3600 lb. each, is located near the center of the yard, and is used to convey the rods into the cleaning house. This conveyer is operated by the cleaning house craneman from an electric push button station located convenient to the crane cab.

The cleaning house building is of acid-resisting construction throughout, and employs a number of entirely new features, including the use of glass brick in place of the customary windows. It is serviced

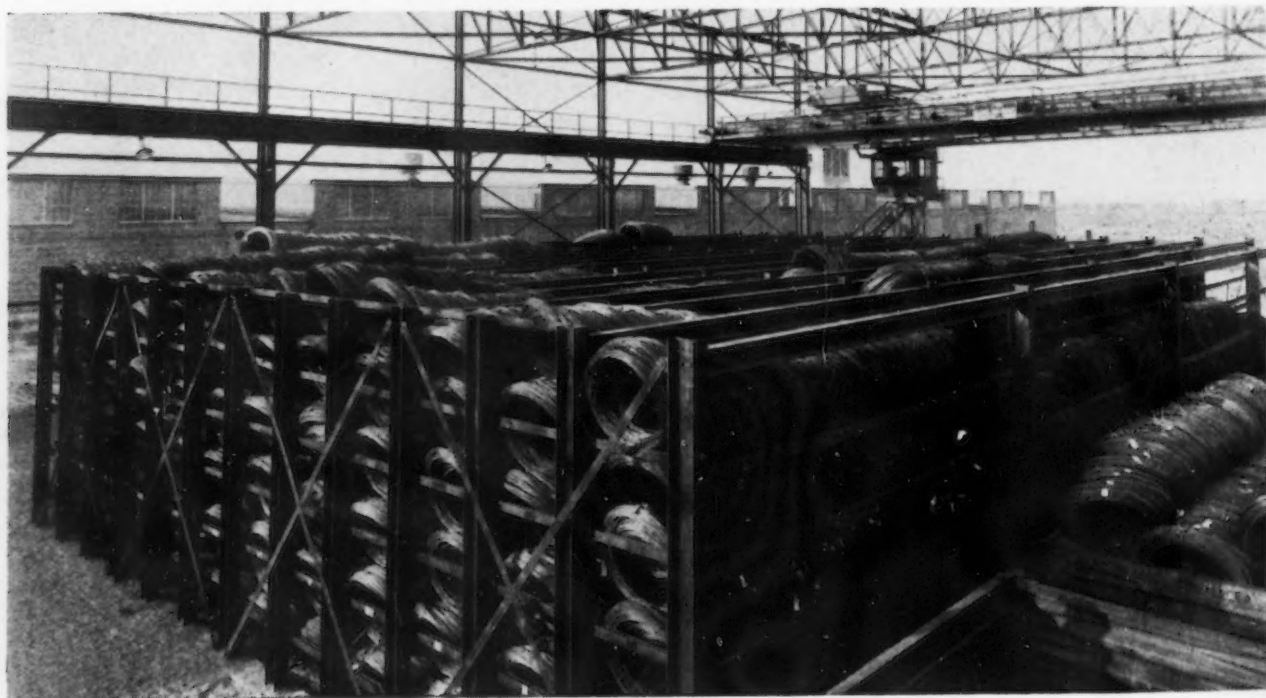
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RODS are delivered by rail to this storage space, where they are handled by a 5-ton, high-speed crane of 96-ft. span.

by a specially designed 5-ton, roller-bearing crane. The line consists of three reinforced concrete, acid-proof brick lined cleaning tanks, one rinse tank, three sull tanks, and three lime tanks.

Acid is stored in two 8000-gal. capacity tanks and is fed by gravity to two measuring tanks. The cleaning tanks are heated by means of jets, and spent acid is discharged from the tanks by a syphon in each tank. Rinsing is accomplished by means of spray nozzles controlled by a balanced valve, which is operated by placing a yoke of rods in the rinsing position. Sulling tanks are provided with special vertical sprays to give proper mist conditions. Lime tanks are steel insulated, and are heated by means of steam jets with automatic temperature control. A circulating pump provides necessary agitation.

A modern two-lane rod baker, indirect natural-gas fired, with automatic temperature control, is located between the cleaning and wire



Electro-Galvanizing Equipment

drawing departments. Bakers are of steel panel construction with 4 in. of rock wool insulation. Heated air in each lane is circulated at the rate of about 10,000 cu. ft. per min. Rods are advanced through the baker on conveyors, similar in design to that in the rod yard. After a lift of rods is deposited on one of the conveyors outside of the bakers by the cleaning house crane, the crane operator presses an electric push button which automatically opens the vertical doors at each end of the baker, advances the conveyor one step, and closes the doors until next operation of push button. In the event the baker line is full, this same button operates a warning bell indicating that fact.

Rods are removed from the discharge end of the conveyor by an electric lift truck, on a specially designed demountable ram, and are delivered to a ram rack immediately behind the wire drawing machines. At this point the rod coils are butt-welded for continuous drawing

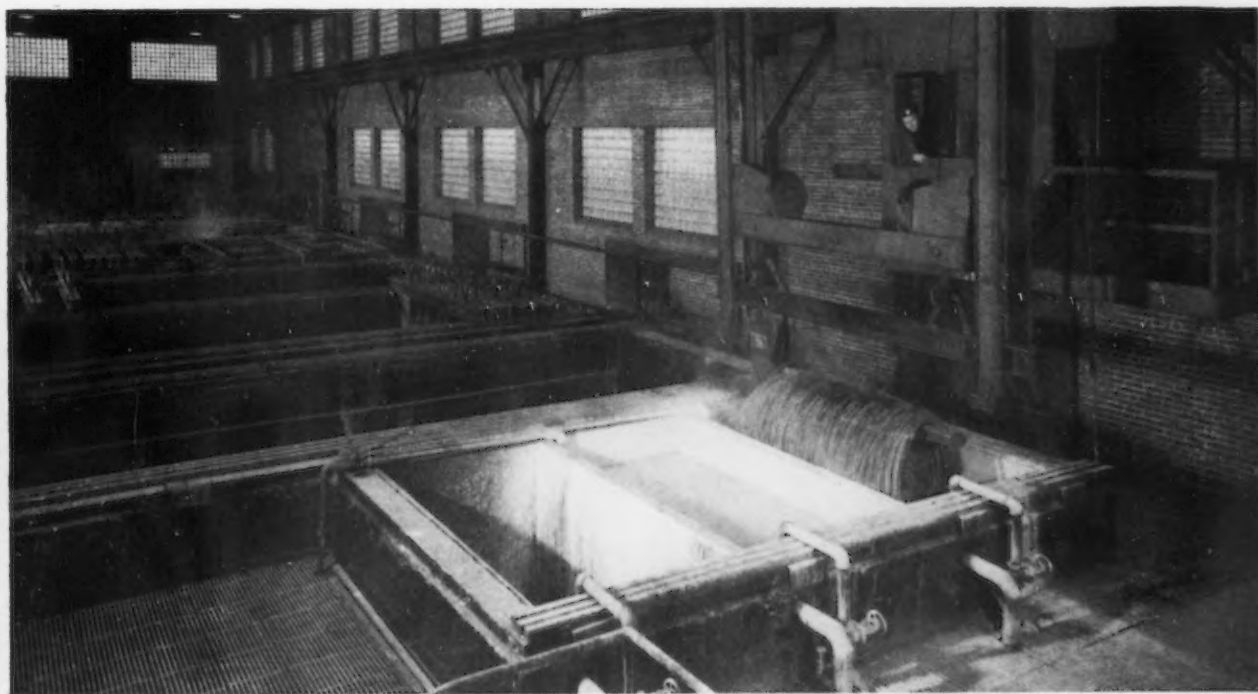
without rethreading the wire drawing machines, and are flipped direct from these demountable rams to the wire drawing machines. The arrangement of conveyors and controls makes the operation of the cleaning house nearly automatic.

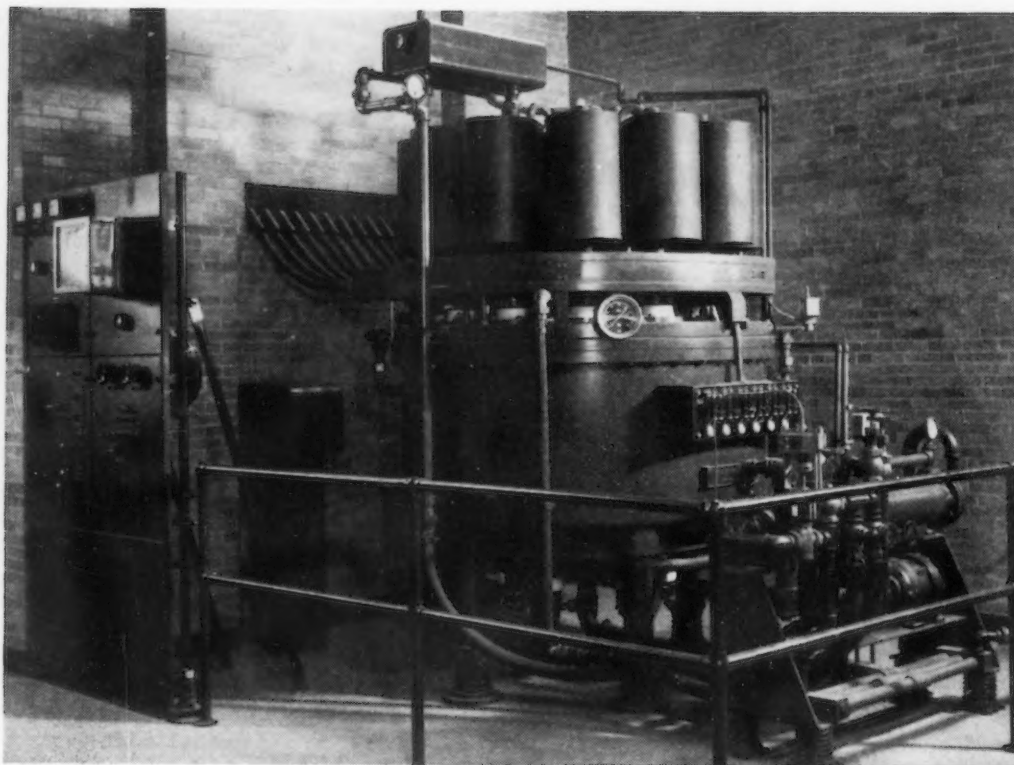
Wire drawing equipment consists of 11 wire drawing machines, as follows: Three continuous machines for four, five or six draft wire; four continuous machines for three draft wire, and four double deck machines for one and two draft wire. These machines are designed for high speed, with variable speed, 230-volt d.c. motors and full dynamic braking control on each block. All motors and blocks are self-contained and air cooled. Machines will handle up to 400-lb. bundles. Continuous pointers are used. The five-hole machines have

a rating of 112.5 available horsepower and a drawing speed of 1000 to 1400 ft. per min. on sizes Nos. 13 to 16 gage from a No. 5 rod. These machines are equipped with 16 or 22-in. diameter interchangeable finishing blocks. Three-hole machines have a rating of 90.0 available horsepower and a drawing speed of 850 to 1250 ft. per min. on sizes Nos. 11 to 12½ gage from No. 5 rod. These machines are equipped with 22 or 24-in. diameter interchangeable finishing blocks. Double deck machines have a rating of 45.0 available horsepower, and a drawing speed of 287 to 861 ft. per min. on sizes ¾ in. to No. 10½ gage. Finishing blocks are 24 in. in diameter. Water-cooled tungsten-carbide dies are used on all wire drawing machines.

Seven one-ton, 16-ft. span tram-

CLEANING house windows are made of glass blocks.





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A MERCURY arc rectifier, rated at 1000 kw., provides direct current for the wire mill.

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PORTABLE electric welders join coils of rod end to end for continuous drawing. Note demountable rams on which rods are carried by electric trucks.

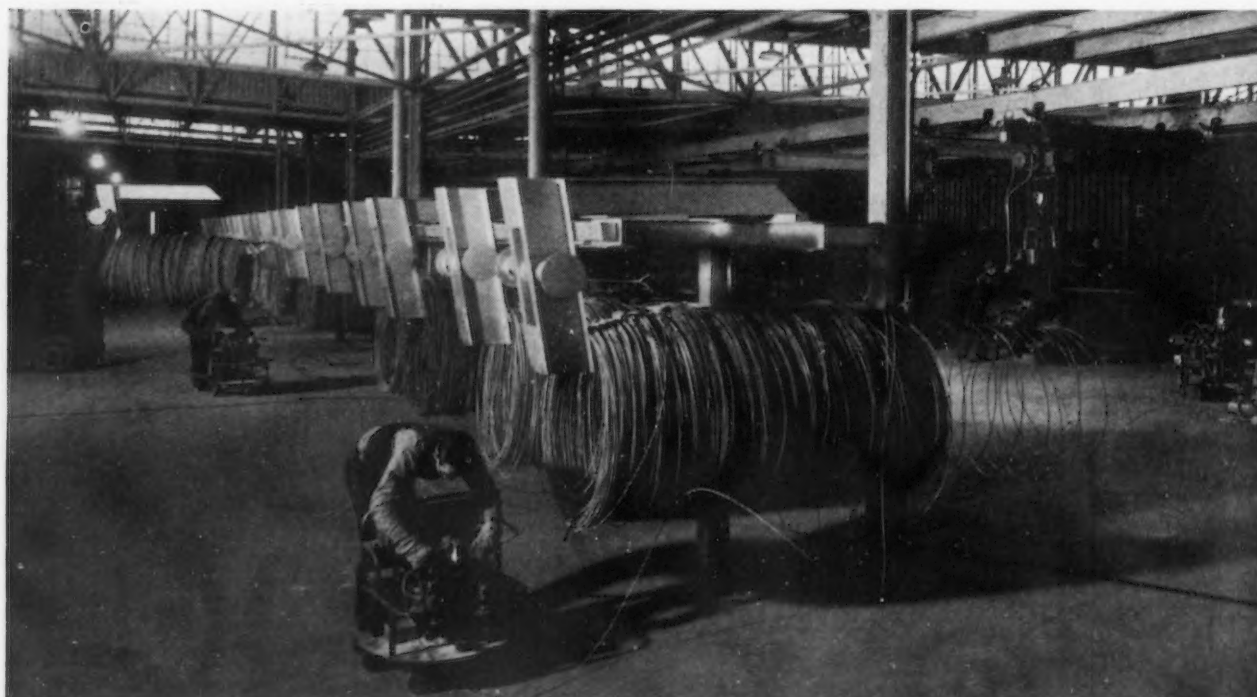
rails, and one-ton, rigid arm hoists with push button controls, having a lifting speed of 35 ft. per min., service the wire drawing machines. The hoists are equipped with collapsible spiders for stripping the wire drawing blocks. After the blocks have been stripped the wire is deposited on corrugated steel skids on which special racks, having a capacity of 6000 lb. of wire, have been built.

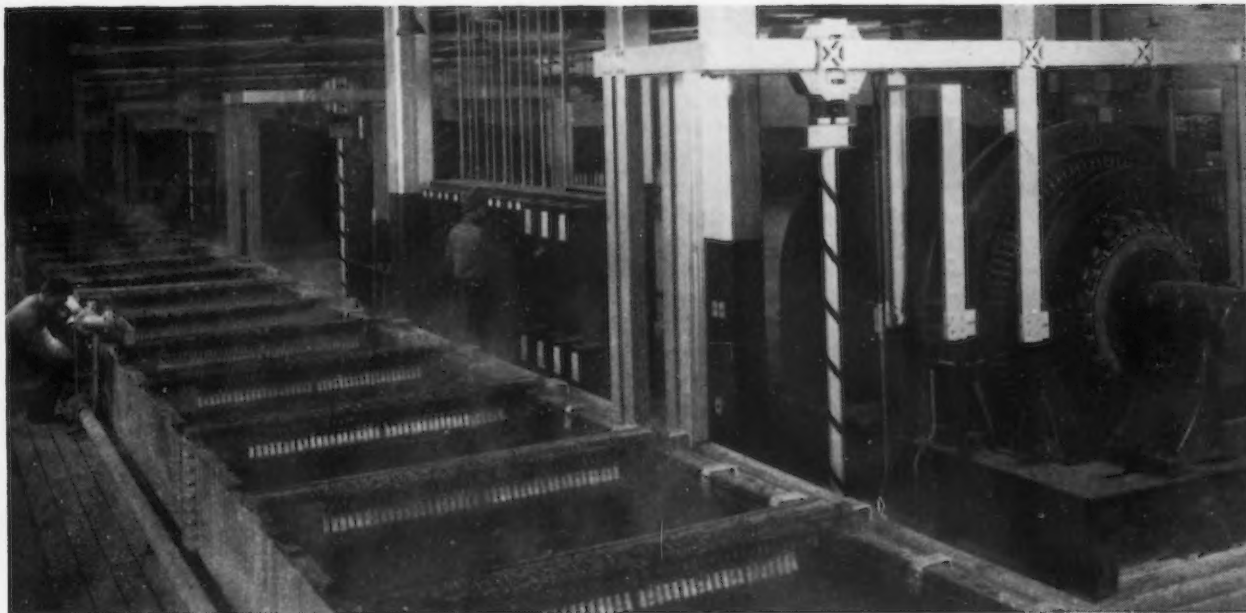
Skids are transferred from the wire drawing department into the process storage or finishing departments by means of an electric lift truck.

Electro-galvanizing equipment consists of a continuous unit which is approximately 500 ft. from end to end. It is equipped with 80 payoff reels to facilitate continuous operation on the electro-galvanizing line, which has a capacity of 40

strands of wire. Coils transferred from the wire drawing or storage rooms on skids by electric lift trucks are placed on the payoff reels by two tramrail hosts.

After normalizing in a pot of molten lead, as in hot galvanizing, the wire is allowed to cool and passes over sheaves into the cleaning tanks which extend for a distance of 70 ft. The wire passes first through a hot alkaline bath





CURRENT from four 15,000-amp. motor generators passes to 27 sets of insulated fingers to form contact with the 40 strands of wire which pass through the electrolytic bath.

which removes all surplus dirt; then through a water rinse and into the pickle tank. After another rinse, minute particles still present in the pores and structure of the steel which might prevent a perfect bond are eliminated by passing the wire through an electrolytic flash cleaner, which etches the surface to provide for firm adhesion of the zinc coatings. After another rinse and a final acid dip it then passes through a final rinse into the electro-galvanizing tank. Strands are kept in line by porcelain sleeves on dividing walls between the various tanks.

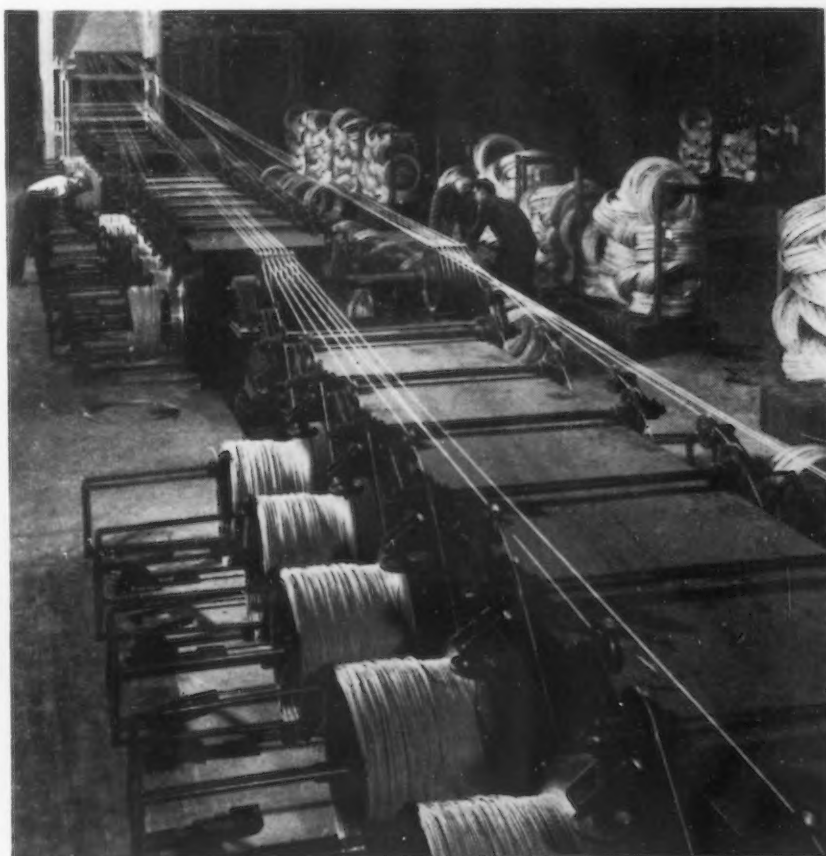
The electro-galvanizing tank is 140 ft. long, 6 ft. wide and 2 ft. deep. It requires approximately 43,000 gal. of special galvanizing solution, which circulates in the direction opposite to that of wire travel after having passed through filters, three 10,000-gal. settling tanks and a cooling tower. Thirty tons of zinc anodes are immersed in this solution in the bottom of the electro-galvanizing tank as the wires, which function as cathodes, pass through it a little below the surface of the solution at speeds ranging from 35 to 70 ft. per min., depending upon the coating to be applied.

After galvanizing, the wire is dipped into a cold rinse to remove adhering solution from the galvanizing tank, then into a hot rinse to remove final traces and to heat the wire so that, when it enters the air,

for winding on the take-up reels, any remaining water will dry quickly. With the coating thickness determined by the flow of current and speed at which the wire passes through the tank, the oper-

ator merely sets the speed of the reels and the rheostats of the generator circuits to a setting specified for each desired coating, to insure a uniform, even deposit on the wire.

The take-up frame consists of



TAKE-UP reels at the end of the 500-ft. electro-galvanizing line.

three separate units, two of these units having 14 blocks each 22-in. and one unit of 12 interchangeable 16 or 22-in. blocks. Each of these units is separately driven by variable speed motors.

Nail machines, 56 in number, are serviced by six one-ton tramrails, equipped with one-ton hoists, which handle the wire from skids to reels directly behind the machines. Machines are belt-driven from roller-bearing equipped lineshafts located in tunnels underneath the main aisles, each set having a separate lineshaft. This arrangement eliminates unsightly overhead belts and lineshafts, facilitates the oiling of shafts and servicing of belts, and in addition eliminates the shadows which are caused by overhead equipment, thus allowing for a closer adjustment of the machines and better inspection of product.

The lead annealing department consists of a gas fired, two-lead-pan-unit, with automatic temperature control, and one 12-spindle take-up frame equipped with 22-in. diameter blocks for 400-lb. coils. The product of this unit is processed into bale ties. The two bale tie machines with bundling attachment have a size range from No. 9 to No. 17 gage in all standard lengths from 7 to 16 ft. Each machine has a production capacity of eight bundles per hour, each bundle consisting of 250 bale ties. These machines are designed for single loop bale ties and will produce either round or oval loops.

Field Fence Department

The field fence department consists of three woven field fence machines, and one poultry fence machine. Machines are of the wrap-stay type. The production range of these machines is as follows: All No. 9 gage fence, including No. 9 gage top and bottom; No. 11 gage fence with No. 9 top and bottom; No. 12½ gage fence with No. 10 gage top and bottom; standard heights, 20 or 40 rod rolls, and either 6-in. or 12-in. stays. The poultry fence machines produce No. 14 gage fence with No. 11 gage top and bottom, and No. 15½ gage fence with No. 12½ gage top and bottom, all 6-in. stays, 10 or 20 rod rolls. The operating speed on all machines is 120 stays per min.

Barb wire is made on 15 machines, 12 of which are for two-point cattle or hog, and three for four-point cattle or hog. A special

four slide machine has been provided for making wire reels for the barb wire. The nail and barb wire departments are equipped with two gasoline tractors, one of which is of the low lift, and the other a tier lift type.

Line start, three-phase motors were used where possible. In the cleaning room, on conveyors and door lifts, high torque line start induction motors fully enclosed with acid proofed windings and ball bearings were used. Cast iron switch cases and control housings with gasketed doors were also selected for use in this locality where acid fumes are so damaging to electrical equipment. Totally-enclosed, ball-bearing line start induction motors were selected for pointer and hoist motors in the drawing room to prevent lime dust from causing frequent cleaning of rotors. Induction motors were used throughout the entire nail mill. With the exception of one motor, all starting equipment in the nail mill is of the line start type, push button operated.

Direct Current Used

All important concentrations of electrical control are found either in the tunnels or on elevated platforms, leaving the floors for process material movements free from obstruction by control apparatus. Direct current supply, used for the first time in any steel and wire mill in the Western Hemisphere, is furnished by a mercury arc rectifier, having automatic voltage control by means of electrically energized grids. This 1000 kw. rectifier is connected to the d.c. bus through a high-speed breaker. The bus is a 9-in. copper channel ½-in. thick, mounted on special insulators and steel beams in the upper part of the connecting tunnels below the mill floors. This bus is at present the largest section of this type ever rolled. It was selected for strength and ease of installation. It is provided with expansion joints at proper intervals and carries d.c. power through the important distribution centers instead of bringing each feeder back to a centralized board. Circuit breakers for remote centers are tapped to this bus in the tunnel. The wire drawing machine control panels are mounted in the tunnel under the machines and adjacent to the bus. Voltage is maintained at load center of this bus by bringing two pressure wires from load center back to the recti-

fier voltage regulator in the power substation.

Transformers are of a recently developed type in which inflammable and explosive oil used for cooling is replaced by a non-inflammable, non-explosive material. Losses are slightly lower in this transformer than in conventional types. The steel clad cubicle switchgear distribution center located in the substation represents the latest in this type of equipment, the oil circuit breakers being of 250,000 kva-interrupting capacity, push button operated, battery trip.

The electro-galvanizing set-up includes six motor-generators, the two flash cleaners being small sets with 20 hp. driving motors and the four plating motor generator sets having 220 hp., 2300 volt three-phase synchronous motors, and 20,000 amp. 7-volt generators. Special 20,000 amp. shunts were built to furnish the necessary voltage drop for operating, recording, and indicating ammeters at the control station.

Control station in the galvanizing department consists of control push button stations for starting and stopping all motor generator sets, circulating pumps and take-up frame motors. Rheostats are located here for control of current output for the motor generator sets and speed of the take-up frames. Feet per minute of wire drawn through the plating bath is recorded on electrical tachometers mounted on the control station board. Indicating voltmeters and ammeters are mounted on the individual motor-generator control panels. Record ammeters are mounted on the individual motor-generator control panels. Recording ammeters are mounted adjacent to the tachometer recorders.

Lighting throughout the mill is supplied from a bank of transformers located centrally to the load in a vault connecting with the main tunnel under the mill floor. Intensities in the drawing room are approximately 12 ft. candles, cleaning room 10-ft. candles, warehouses 5-ft. candles, galvanizing 8 and 14-ft. candles, and nail mill 12 to 15-ft. candles.

This new wire mill occupies a total area of 177,000 sq. ft., including the outside crane runway yard, which is used for rod storage. A clear span of 100 ft. has been provided in the wire drawing, process

(CONTINUED ON PAGE 146)

Skyways Handling Systems Are Versatile

° ° °

By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

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THE most expensive factor in industry today is manpower. The greatest single task of management, aside from employee relations, is that of utilizing this expensive factor effectively; of directing the efforts of the manpower employed at tasks which will yield profits.

One task, common to every manufacturing plant the country over, yields no profit; is a downright deadweight expense which absorbs fully one-fifth of industry's labor payroll. Handling, of materials, of parts, of product, cannot be avoided. It is an essential of every operation. But handling costs may be pared to the bone by being performed with mechanical equipment instead of human muscle.

The crucial problems are concerned with the handling of small loads, not big ones. Problems of handling loads of heavy tonnage have largely forced their own me-

chanical solutions; they have been so obvious. Lighter loads are still too often moved by hand rather than by machinery. The careful planning and systematic routing of handling operations throughout the plant offers management two rich rewards: 1, Genuine production economies, and 2, The release of manpower for *effective* production effort.

Careful planning and systematic routing—in these five words is embodied the essence of modern materials handling methods. They tie the means of handling directly into a routine of production designed to secure maximum results from minimum effort. Note particularly that it is not materials handling *equipment*, but materials handling *methods* which is the key to the problem. All types of equipment may be, and frequently are, made to suit the requirements of a method which has been evolved as the solution to any particular materials handling situation. A method is a planned system of operations, utilizing that equipment which best fits its needs. Without the planned system of operations back of it, no item of

materials handling equipment can yield its utmost economies in manpower savings.

Perhaps this point may be most clearly seen in considering the advantages and limitations of a type of handling equipment which may be termed "skyways transportation," since it operates entirely overhead and thus conserves valuable floor space for machine location and for storage purposes.

Industrial Skyways Transportation

Imagine an industrial railroad system in the manufacturing plant completely removed from the floor, running everywhere within the plant, and outside of it when needed, picking up its own freight at any point and delivering it to the fraction of an inch wherever desired. That is industrial skyways transportation—more commonly known as monorail-trolley-hoist equipment.

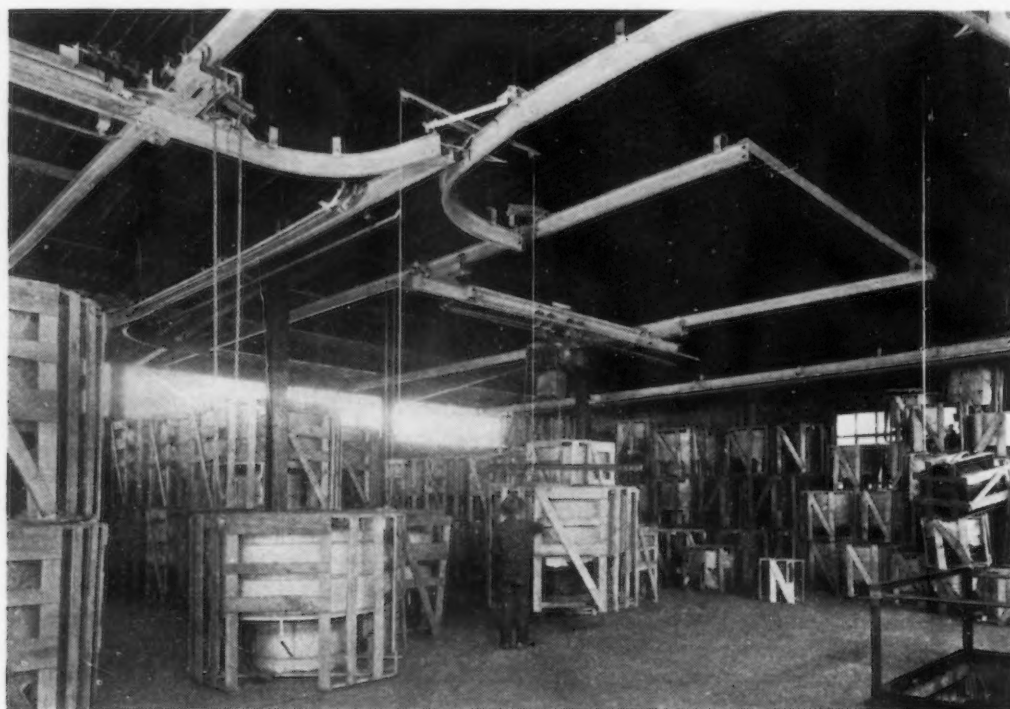
Monorail track may be hung anywhere. It is up in the "sky"—out of the way. It may be installed in straight track sections, or bent in simple or reverse curves. Spur tracks may lead off a main line at

any angle, to cover a specified area completely. The track may be suspended in a horizontal plane, or with load drive sections may be run up or down gradients just like a standard railroad. It may be made part of a traveling crane system; it may traverse a building, go out-of-doors across a yard and traverse a second or third building. It is equally adapted as a transportation line for the handling of materials at and from a receiving department, for the handling of materials and parts in process, to and from machines, for the handling of progressive assembly operations, and

functions; or be incorporated into production equipment such as dipping machines, drying ovens, charging apparatus, scales, etc. They can carry a steady stream of work through spraying, sand-blasting or finishing machines, or through cleaning or painting tanks, or hold work in one place for hours during a processing operation. They will handle light loads, or loads up to several tons in weight with equal facility, and with equal dependability carry loads of molten metal, trays of delicate glassware and unwieldy bundles of steel bars, pipe or lumber.

representing many different industrial operations. Probably no single plant would ever look like this; certainly such a variety of operations would never be massed into such crowded quarters. From a production standpoint there are innumerable things wrong with the layout. But this conglomerate drawing was made with a single thought in mind—to show in one picture as many different ways as possible of utilizing a skyways system of industrial handling.

Starting at the coal pile outside the power plant, it traces the handling of raw materials at the re-



LOUDEN monorail overhead trackage and transfer crane, with electric hoist, as used in the storage department of a metal working plant.

for the handling of finished product to and through the shipping department.

Monorail trolleys, or carriers, may be hand-propelled or electrically propelled. They may be equipped with simple hooks, grapples or slings of various kinds, or with hand hoists, pneumatic hoists or electric hoists. Hand-propelled trolleys may be coupled to electrically propelled trolleys just as railroad cars are attached in strings to a locomotive to form a train, operating anywhere over the entire trackage system. They can serve as occasional point-to-point carriers, or provide rapid transit at the rate of many hundreds of feet a minute. They can travel along an assembly line and set the pace for production; become a part of many automatic

Skyways industrial transportation systems are flexible, adaptable and capable of expansion as the need arises. They are economical in operation, and produce an additional economy of the greatest importance in that by removing the handling operations from the floor they conserve valuable ground space.

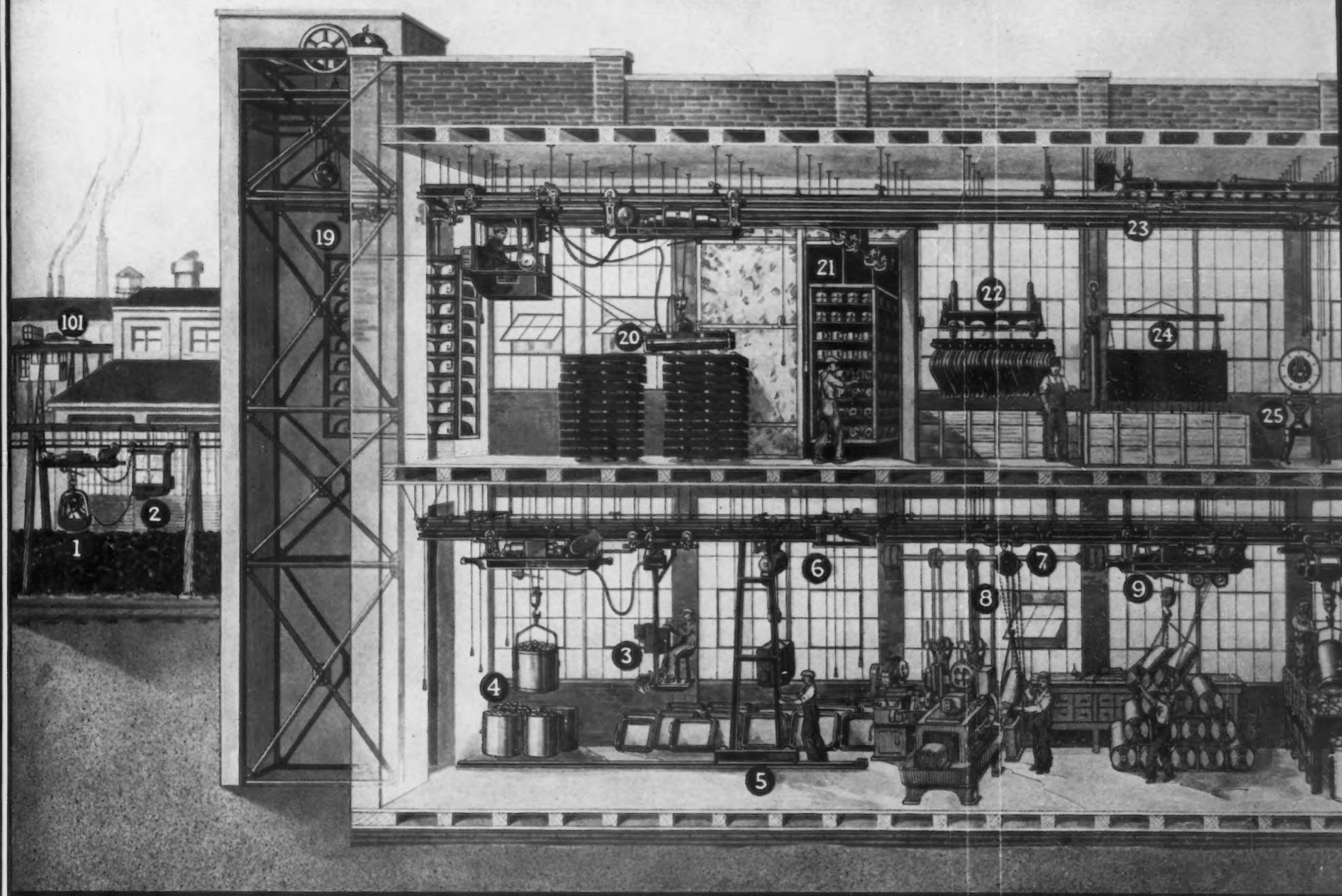
That's a big order! But let us examine some typical skyways handling methods and see whether they meet these broad statements properly.

The Insert Chart

The accompanying chart, reproduced by courtesy of the Cleveland Crane & Engineering Co., is an attempt to visualize in small space many of the typical handling operations to be met in a composite plant

ceiving end of a business, touches machining operations and foundry work, covers the transfer of goods from railroad cars into the plant, illustrates such processing procedure as baking, painting, drying and weighing, shows a method of cupola charging, takes materials in overhead tractor trains to another building, pictures an application to storage problems, and indicates briefly the solution of a plant maintenance problem. A careful study of this chart will repay any reader who is on the lookout for ideas for improving his own materials handling methods.

In considering the various applications shown on that chart keep in mind the fact that there are two basic principles underlying the use of all mechanical handling equip-



A Visual Guide to the Application of Overhead Materials Handling Equipment

AN attempt has been made in the above composite drawing to visualize many uses for overhead materials handling equipment of various types. These uses do not, of course, cover the field completely. They do however suggest, better than thousands of words of description, the great range of applications to which such equipment is adapted. A careful study of this drawing will undoubtedly result in the development of many other ideas which may be put to use profitably in almost every industrial plant.

Reference is made below to the corresponding numbers on the drawing:

1—Outdoor or indoor coal handling equipment consisting of monorail track and manually or electrically operated trolleys with clamshell buckets or other containers.

2—Outdoor electrically operated, cab-controlled monorail carrier for yard operations. Cab is completely enclosed, and waterproof.

3—Electrically operated indoor carriers arranged for control from a suspended, open, operator's platform. May be used to haul strings of hand-operated carriers.

4—Hand or electrically operated monorail carriers used to pick up and transfer buckets of bulk material or tote boxes of small parts.

5—Hand or electrically operated tramrail gantry cranes, double leg, or single leg with opposite end of crane supported by overhead monorail track.

6—Monorail switches, hand or electrically controlled, permit carriers to leave main line for any number of spur lines covering adjacent areas.

7—Hand propelled carrier with hand, pneumatic or electric hoist, used to spot work rapidly and accurately on machine tools.

8—Hand hoist, suspended from hand propelled carrier for intermittent handling of light loads which need not be shifted great distances.

9—Floor controlled electric or pneumatic carriers with electric or pneumatic hoists, for heavier loads to be shifted greater distances.

10—Floor controlled hand propelled carriers with pneumatic hoists for heavier loads and short transfers infrequently.

11—Hand controlled, hand propelled foundry carriers for too heavy work in the immediate neighborhood.

12—Floor controlled electric or pneumatic hoist on a tramrail crane which permits transfer to the rail track lines.

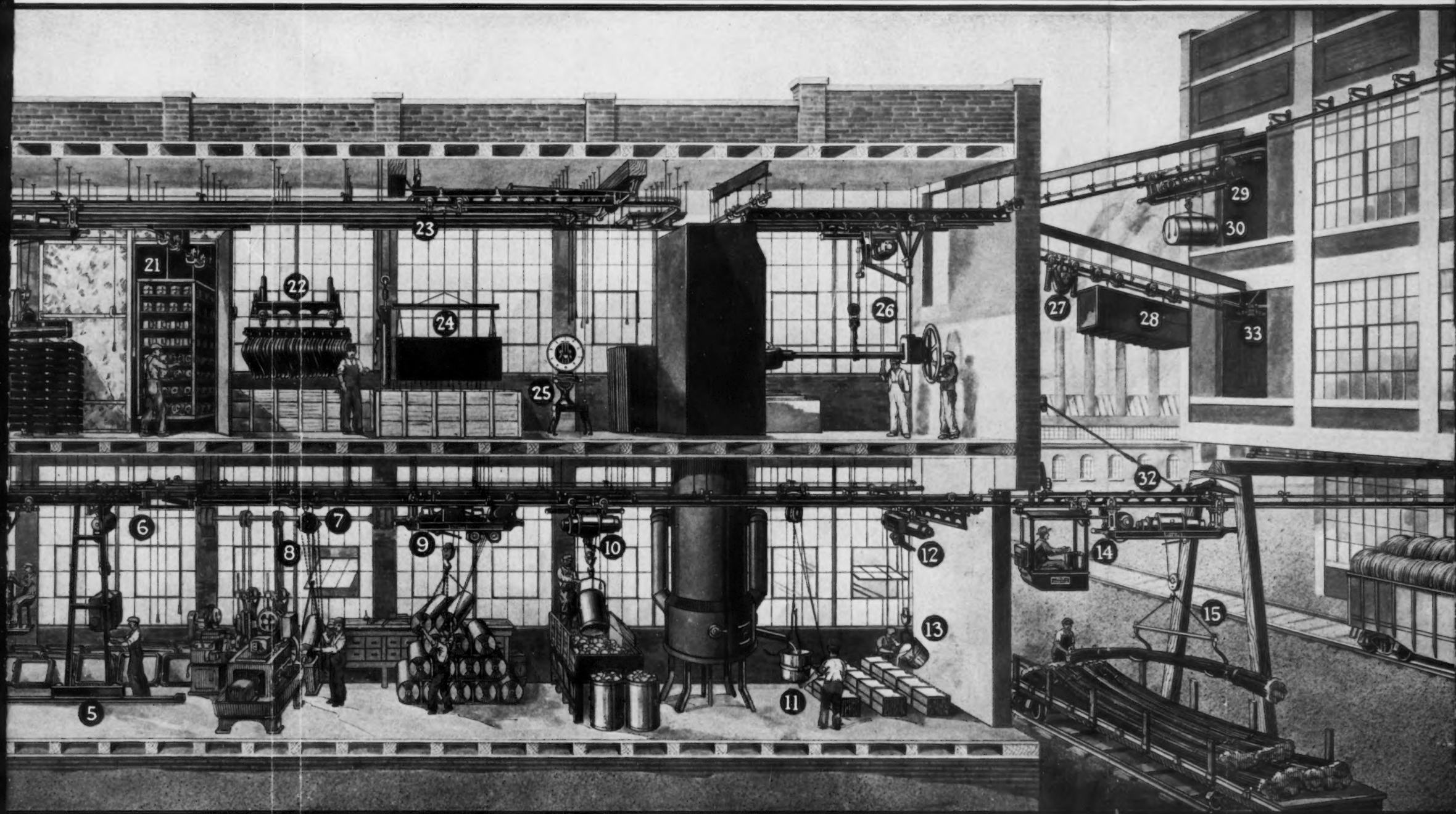
13—Electrically or pneumatically controlled hoist for use with heavier loads in foundries.

14—Electrically operated cab-controlled monorail carrier indoors or outdoors. Cab is entirely open.

15—Double hook lifting bar device suspended from monorail for rod and wire handling work.

16—Hairpin type hook suspended from double hook hoist, used for handling coils of wire or strip.

17—Metal cleaning overhead or gantry crane with machinery located out of the region of acid fumes.



A Visual Guide to the Application of Many Types of Industrial Skyways Equipment

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, hand or electrically controlled, permit carrying for any number of spur lines covering

carrier with hand, pneumatic or electric hoist, and accurately on machine tools.

ended from hand propelled carrier for interchanging loads which need not be shifted great

electric or pneumatic carriers with electric or pneumatic hoists for heavier loads to be shifted greater distances.

10—Floor controlled hand propelled carriers with electric or pneumatic hoists for heavier loads and short transfer movements made infrequently.

11—Hand controlled, hand propelled foundry ladle carrier, for not too heavy work in the immediate neighborhood of the cupola.

12—Floor controlled electric or pneumatic hoist carrier operating on a tramrail crane which permits transfer to the connecting monorail track lines.

13—Electrically or pneumatically controlled ladle-pouring device for use with heavier loads in foundries.

14—Electrically operated cab-controlled monorail carrier for use indoors or outdoors. Cab is entirely open.

15—Double hook lifting bar device suspended from electric hoist for rod and wire handling work.

16—Hairpin type hook suspended from double cable type electric hoist, used for handling coils of wire or strip metal.

17—Metal cleaning overhead or gantry cranes, with working machinery located out of the region of acid fumes.

18—Wire block stripping cranes and monorail carriers. Similar equipment available for a variety of special handling requirements.

19—Tray elevators for floor to floor travel, or for use as dipping machines to handle trays of product into and out of dipping tanks.

20—Electrically operated, cab-controlled sheet metal grabs permit a single operator to perform a wide variety of handling operations.

21—Rack type carriers suspended from monorail track which runs into core ovens, baking ovens, drying ovens, pottery kilns, etc.

22—Drop sections of monorail track used for dipping loads of material into cleaning, plating or painting tanks.

23—Simple hand propelled monorail carriers in capacities up to two tons, used where time is not an important element of the handling problem.

24—Dipping equipment, hand-operated, suspended from hand propelled monorail carriers, used for slow-moving production operations.

25—Tramrail overhead track scales may be incorporated into the skyways handling system at any point desired. Scale may be set overhead or on the floor.

26—Furnace and cupola charging devices are available, for hand operation or electrically controlled.

27—Monorail carriers electrically operated as tractors and controlled automatically.

28—Fully enclosed freight container systems. Special types of carrier containers is available.

29—Electrically operated tramrail carriers to climb grades, or a driving chain may be used up steeper grades.

30—Barrel and case grabs and slings available in a wide variety of special design for service.

31—Special window washing cage. Not available for any number of plant main

32—Jib cranes may be used as the departmental overhead trackage system permit closing of the plant doors.

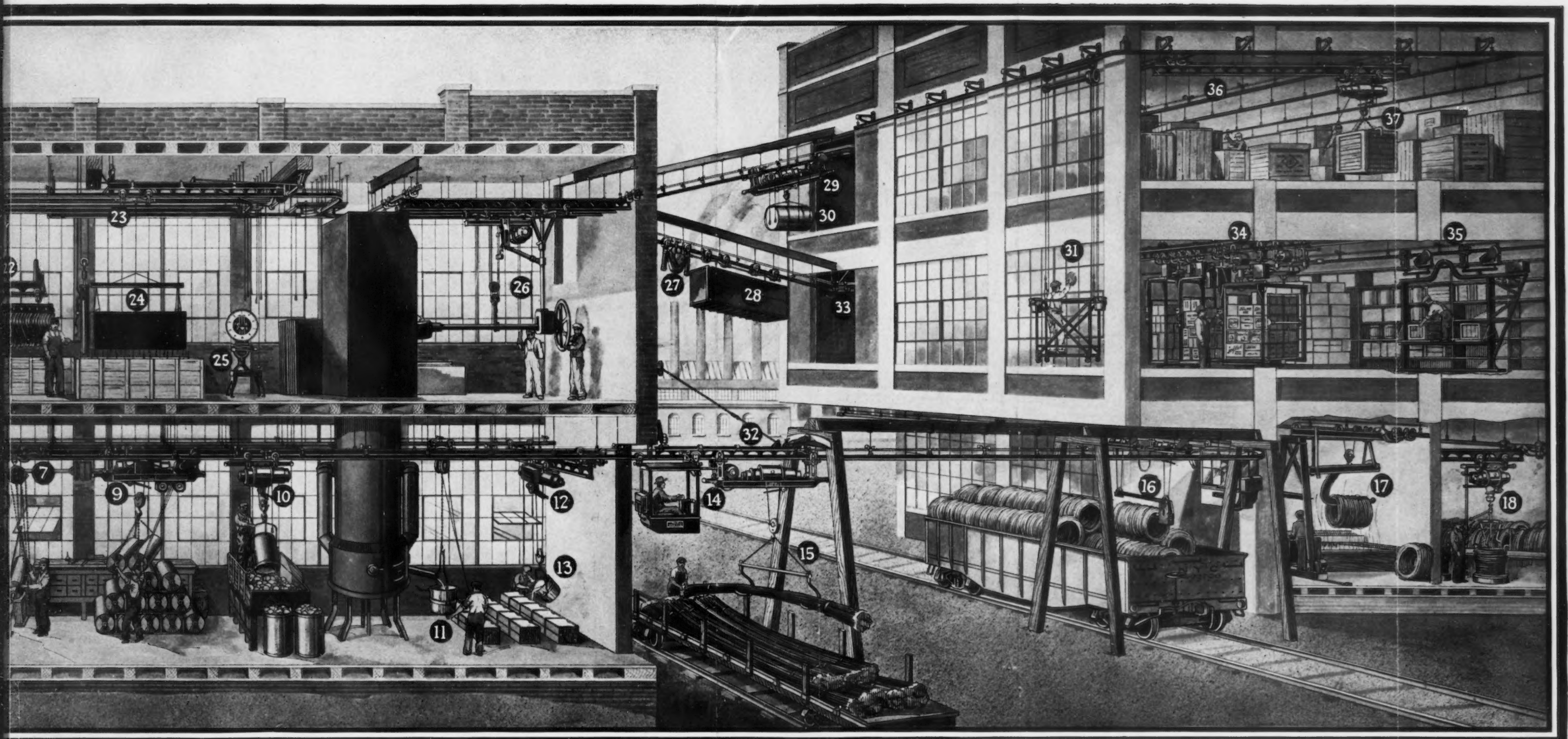


Illustration courtesy Cleveland Crane & Engineering Co.

Visual Guide to the Application of Many Types of Industrial Skyways Equipment

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26—Furnace and cupola charging equipment. A variety of such devices are available, for hand operation or pneumatically or electrically controlled.

27—Monorail carriers electrically operated may be designed for use as tractors and controlled automatically or remotely.

28—Fully enclosed freight container carrier. A wide variety of special types of carrier containers is available for skyways handling systems.

29—Electrically operated tramrail carriers may be designed to climb grades, or a driving chain may be used to haul the carrier up steeper grades.

30—Barrel and case grabs and slings of various types are available in a wide variety of special designs for any conceivable handling service.

31—Special window washing cage. Monorail track and carriers are available for any number of plant maintenance jobs.

32—Jib cranes may be used as the outdoor terminal of an inter-departmental overhead trackage system. May be swung up to permit closing of the plant doors.

33—Knock-out or lift links may be used where overhead tracks pass through doorways or windows to permit closing of doors or windows when system is not in use.

34—Order make-up train, consisting of an electrically operated trolley and a string of hand operated trolleys, all with suitable containers, coupled together.

35—Electrically operated tiering machines or compartment stackers may be suspended from the overhead monorail trackage system and used as carriers.

36—Monorail cranes and transfer bridges may be so arranged that the carriers may transfer at various points to the overhead trackage system within the plant.

37—Below the hook grabs, slings, buckets, etc., may be had to handle any kind of load to be found in or around the industrial plant, within the system capacity.

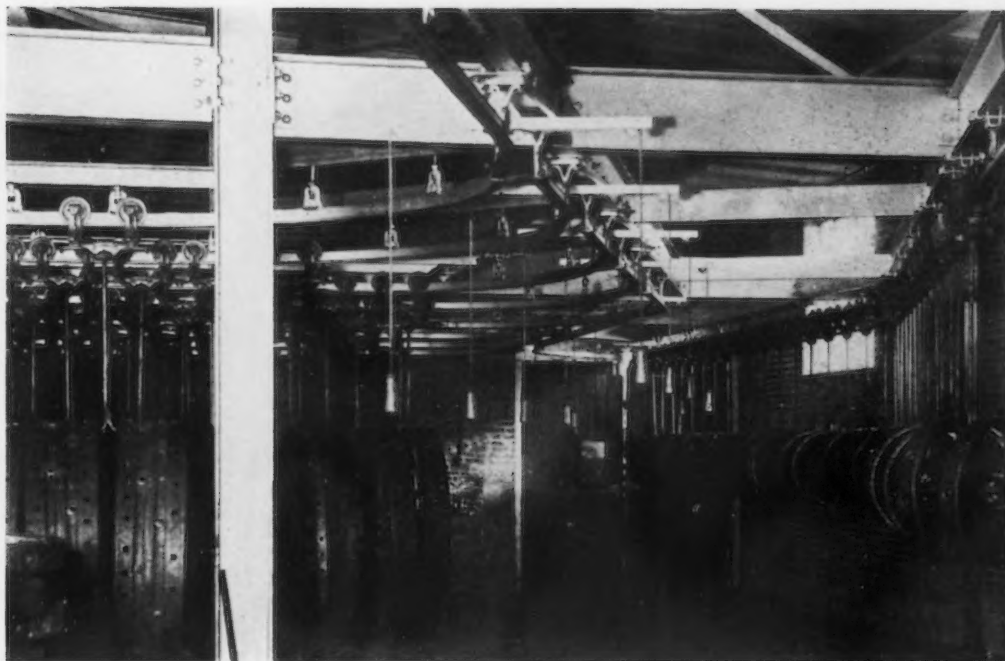
101—Custom built travelling or gantry cranes may be equipped with monorail sections to connect with plant overhead trackage systems, without difficulty.

The Iron Age, May 13, 1937

o o o

L OUDEN monorail spur tracks provide temporary storage for two tractor wheels per carrier while waiting for delivery to the assembly line.

o o o



ment. Whether that equipment be trucks, conveyors, hoists or overhead carriers, every installation of mechanical handling apparatus is successful and profitable only as it eliminates the necessity for rehandling, or as it permits the handling of larger quantities with the same amount of physical effort and at the same or lower cost.

These principles are so important that their restatement, in different terms, is worth while for the sake of making their meanings absolutely clear:

Principle 1. Effective mechanical handling equipment should pick up the load and transfer it to its destination in a continuous series of operations without rehandling at any point along the way. Once the load is in or on the handling device, there should be no necessity whatsoever for human beings to pick it up or transfer it manually to another piece of handling equipment. The original handling device should deposit it exactly where it is needed, and nowhere else. All rehan-

dling, of any nature whatsoever, costs money.

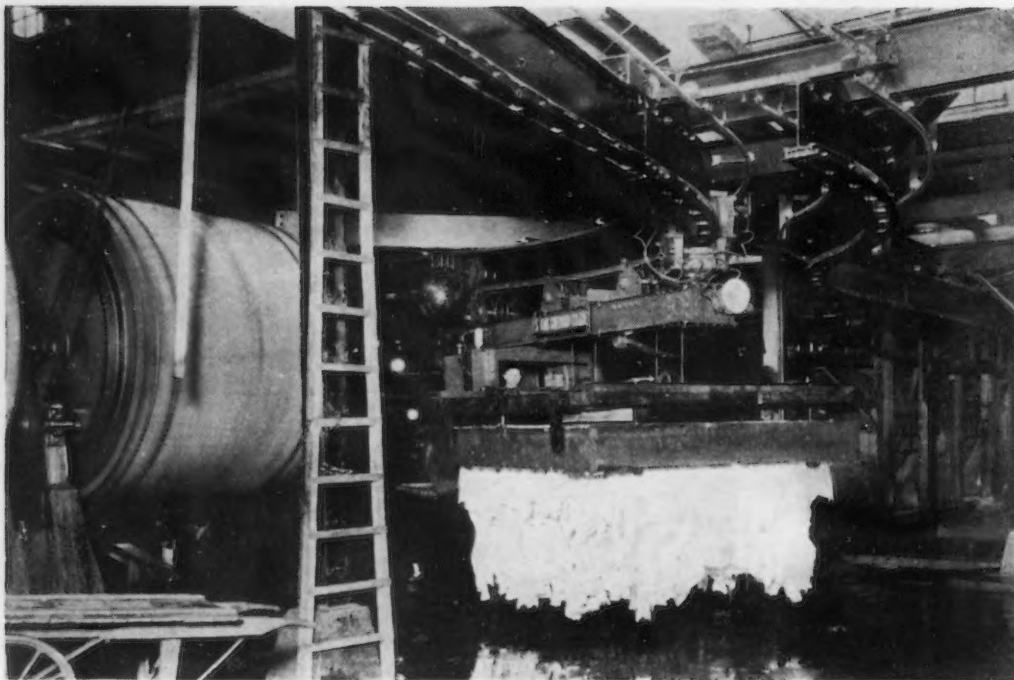
Principle 2. Effective mechanical handling equipment should be of such a nature as to permit an increase in the size or quantity of the unit of production, or of the unit handled. If a 60-lb. tote box load, or three 20-lb. metal bars, or a tray of 100 eight ounce glass jars represents the unit load a man has been handling, then mechanical equipment designed to lighten the burden of that man's work and increase his production capacity

o o o

S HEPARD - NILES 4-ton monorail, cab-operated electric magnet hoist on transfer crane which connects with many adjacent monorail tracks covering a scrap yard.

o o o





AT LEFT
SHEPARD - NILES
twin hook hoist,
cab - operated, de-
livering a frame of
hides from a tanning
vat to the stretch-
ing room, without
rehandling.

o o o

BELOW
OUTDOOR jib
crane terminal
of Loudon overhead
trackage system, as
used with electric
hoist to transfer ma-
terials from railroad
cars into the plant.

should be designed to handle from two to ten times that load, safely, rapidly and accurately. Or, if the nature of the loads to be handled does not permit of increasing their size, then the mechanical handling equipment should increase the speed of handling so that the unit of production in any given period of time is increased materially. Otherwise the mechanical handling equipment is just another "gadget" which, although it may lighten labor, does not contain within itself the possibility of directly reducing production costs. This second principle is true both for the comparison of a piece of mechanical handling equipment with manual handling methods, and for the comparison of a proposed new handling system with an existing and possibly out-moded installation.

Both principles, taken together, have come to be recognized as the criteria by which the economic value to any particular user of any type of mechanical handling equipment may be judged.

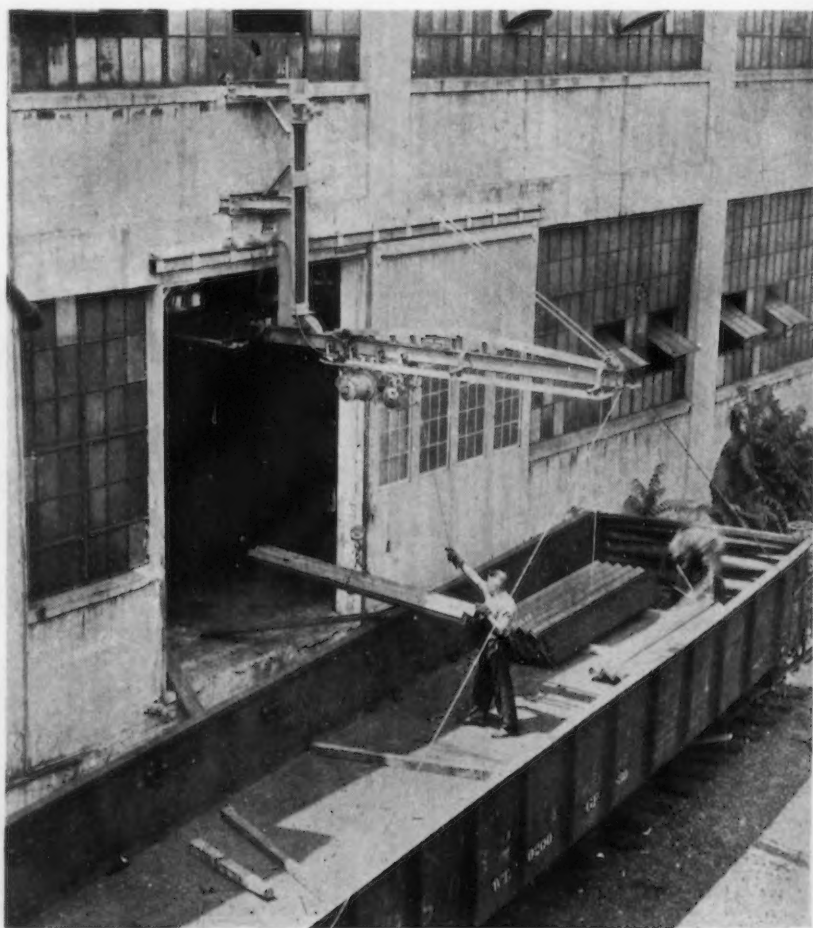
Typical Industrial Skyways

The accompanying illustrations exemplify the application of these two principles. In a metal working plant the storage room is equipped with an installation of Loudon monorail tracks and cranes. The "bridge" of each crane is capable of matching up with the monorail track at various points to permit the suspended hand propelled trolley and electric hoist to cover

every part of the room. Switches are located at advantageous points in this overhead track, and sections of the track lead out of the room to other departments and to outside shipping platforms. Continuous movement to any point is thus af-

forded, for loads up to two tons or more.

Another illustration shows how the outside terminal of such a system is rigged up. This Loudon monorail jib crane is hinged at the lower end of the channel building



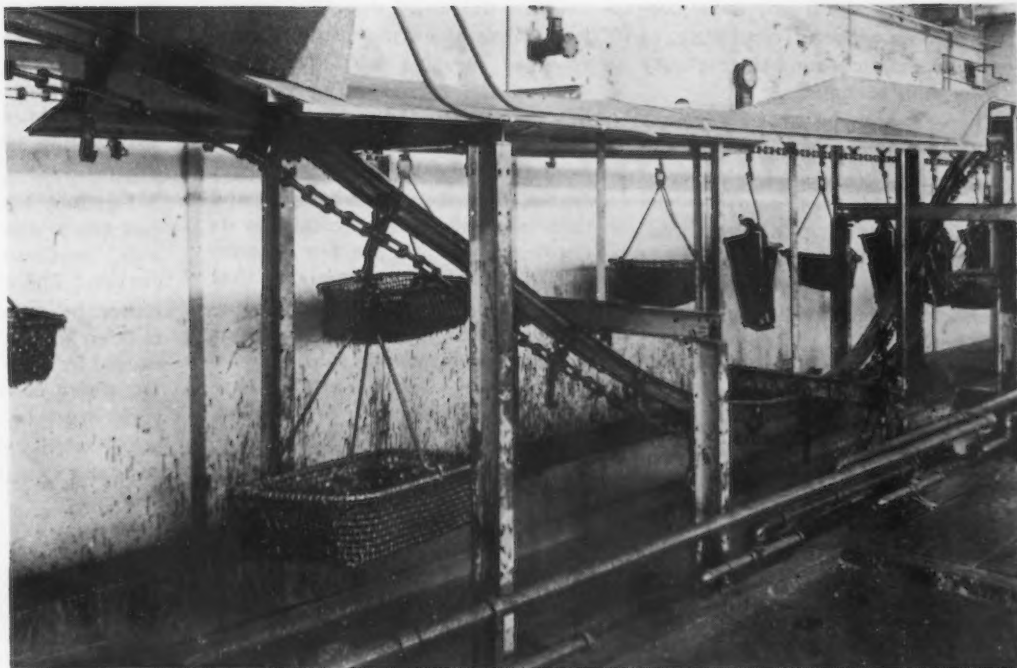
AT RIGHT

MATHEWS trolley conveyor dips baskets of finished parts into a paint bath, then brings them up and on the return takes them to a drying room, continuously.

o o o

BELOW

AN odd, intermittent production job taking but a few minutes each day, is well handled by a Shaw - Box electric hoist brought to the job on a monorail track.



support, so that it may be drawn up out of the way of the door when it is desired to close the door. In its working position, guy ropes fastened to the railroad car steady it, while materials are being picked up out of the car and run to any point indoors, or taken from any point in the building out to and loaded into the car. And again the principle of

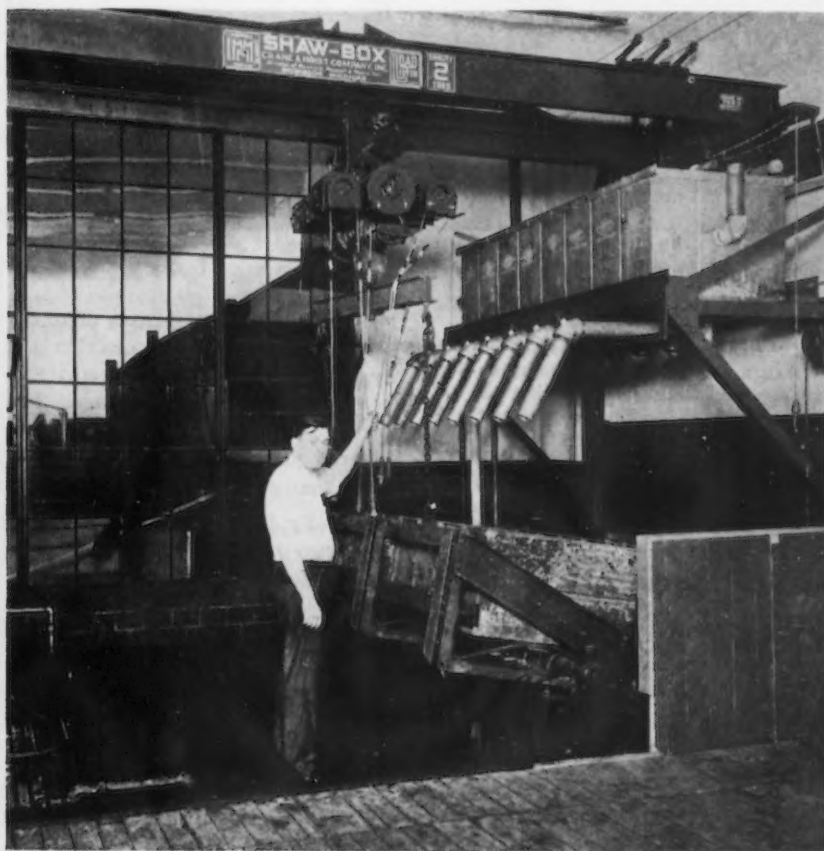
continuous flow without rehandling is demonstrated, as well as the handling of loads several times the weight which could be handled by a man.

Still a third Louden monorail installation is shown in the plant of a tractor manufacturer. Here, hand propelled trolleys carry a hanging rod with two opposed hooks. Thus

each trolley is capable of handling two tractor wheels. The main line of track (to the left) branches off into eight spur tracks, each providing temporary storage for wheels which may be transferred at a moment's notice to the assembly line, located in another room. No rehandling is required, even through the period of temporary storage, and each trolley handles twice the load of a man.

A Shepard-Niles 4-ton monorail transfer crane with cage-operated electric magnet hoist is shown operating in a scrap metal yard. The hoist can leave the transfer crane to travel over various connecting overhead tracks to cover adjacent irregular shaped areas, or to enter adjacent buildings, thus providing an efficient system of interdepartmental transfer of many kinds of loads. The magnet may be replaced as needed by various grapples or buckets, or the simple hook used to pick up suitable loads.

Another Shepard - Niles electric hoist, equipped with twin hooks, is shown rounding a curve and approaching a switch in the monorail trackage system of a large tannery. This system, with a monorail transfer crane covering 72 tanning vats, handles a capacity of 7200 hides. The single operator, in his protected cab, picks up a frame load of hides out of a tanning vat, takes it over the trackage system to the stretching room, then picks up a fresh frame of hides to fill the vat from which he has just removed the first



frame. And again we have continuous flow without rehandling, of loads altogether beyond the capacity of one man to handle.

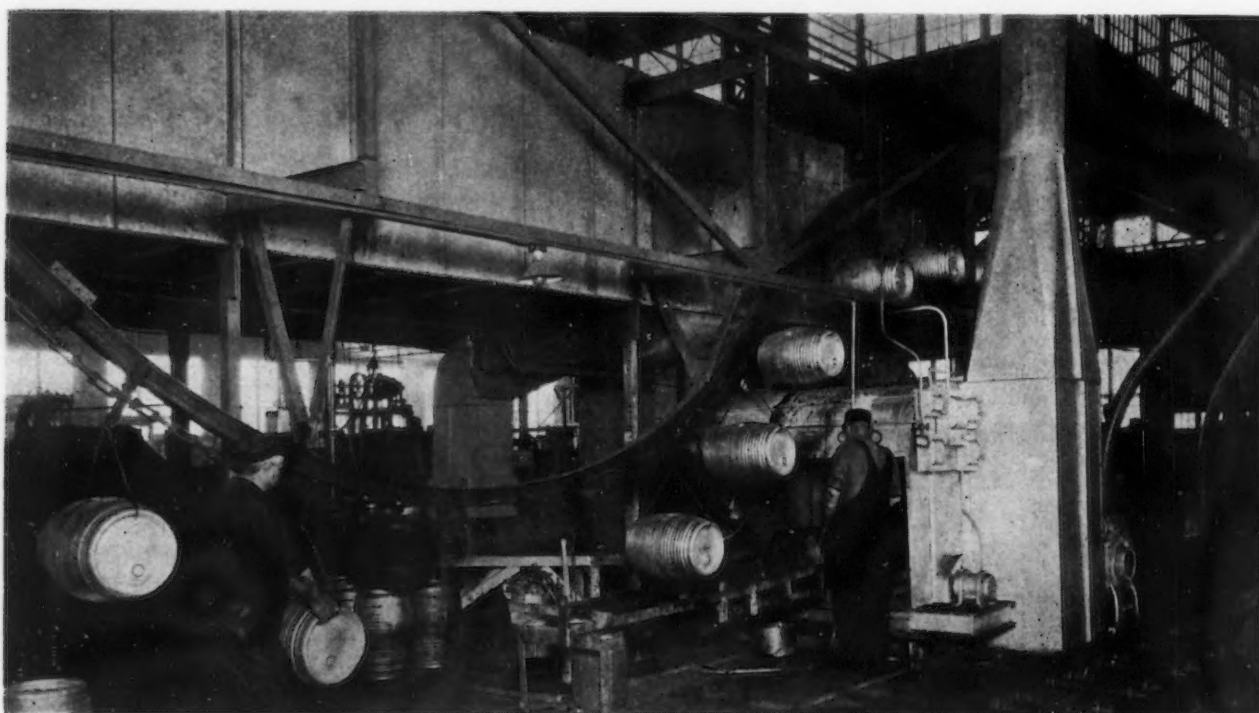
There is a type of skyways handling which is a cross between the overhead tramrail and the conveyor; partaking of many of the qualities of both. A Mathews conveyor installation of this type is shown in the plant of a manufacturer of agricultural implements. Wire baskets filled with parts hang from tramrail trolleys regularly spaced along a driving chain. Approaching a tank of paint, the track descends sharply, submerging the baskets of parts in the paint bath,

used in the daily dumping operation. Only a few minutes a day are required for this job. The hoist, used in the refrigerating room to lift cans in and out of the brine tanks, is run over here on the overhead track, hooks on to the rocker frame, does its appointed job, and then is whisked back quickly to its regular work. Only a few minutes a day, but what a convenience that shiftable electric hoist provides during those few minutes! Hundreds of plant maintenance jobs may be made easier when a suitable skyways handling system is installed.

With all their flexibility of service, their adaptability to practical

tracks are suspended must be strong enough to bear the additional weight of the tracks, the carriers and the loads, with an ample margin of safety, or else supplementary supporting structures must be erected.

Further, loads carried on mono-rail track will swing from side to side, particularly when rounding curves. The tracks must therefore either be supported in such rigid fashion as to withstand the stresses caused by such swinging of the load (in which case the trolleys or carriers must be designed to provide the flexibility required to accommodate the swinging stresses without



then rises to lift them out; whence, on the return trip as shown in the background, they go through a drying room. Here the principles are, continuous flow with speedy production. One more similar illustration is shown in a brewery. Here the loading station of a Chain Belt installation is shown. Metal barrels are inspected, repaired, spray-painted on the outside, and loaded onto the trolley conveyor for transfer to other departments.

Finally, just to show the convenience a skyways handling system may bring to miscellaneous plant operating problems, a picture is reproduced of a Shaw-Box electric monorail hoist in an ice plant being

CHAIN BELT trolley conveyor loading station. Metal barrels are inspected, repaired, spray-painted, and removed by the conveyor to another department.

o o o

ly every type of handling work, and the readiness with which such systems may be extended to meet future needs without any change in existing equipment, it must be remembered that skyways industrial transportation systems are basically fixed installations. The trackage systems must be built into place in the plant. The structural members of the building from which the

damage either to the track or to the carriers themselves), or else the track must be suspended non-rigidly from a rigid superstructure. The latter method is generally considered properly applicable only to light load-carrying systems.

Finally, in the case of electrically powered systems, bare conductors in the form of trolley wire or charged collector rails, must be installed, which, under certain conditions, may create a fire or accident hazard.

These conditions should be kept in mind in planning the use of an overhead handling system, and due provision made to meet them.

Machine Tool Replacement

By E. P. BLANCHARD
Sales Manager, The Bullard Co.

IT is important today that management of American industry meet squarely the problem of replacing its investment in machine-tool equipment. This investment must be protected if we are to maintain our position as the world's industrial leader and continue the investor's interest intact. In previous eras of prosperity, with ever-expanding markets, the infiltration of new machine tools purchased for expansion, has kept total investment in equipment at a high average value and capability. We will continue to have expansion of markets, but at a slower rate than in the past—sufficiently slow, in fact, to make it impossible to maintain our overall efficiency by purchasing machines for increased capacity only. As a result, management must now take direct action in the way of replacing industry's machine-tool investment and maintain constant policy to this end.

Profits, of course, are the prime objective of any replacement program. For many years management has been quite aware of this profit possibility through the direct savings by cost cutting in the use of modern machine tools—but should all replacement be based upon this single condition? Inestimable indirect and tangible benefits are possible through replacement with modern tools and must now be seriously considered in addition to the profit motive.

Replacement of this order will require keen judgment on the part

IN the old days, gone but not forgotten, the problem of replacement of machine tools was much simpler than it is today. With expanding markets, replacement had, as its chief factor, the purpose of increasing output. Today, the chief factor is the increase of profits through the decrease of cost.

Other new factors, or at least ones little recognized in the past have also entered the picture. Of these, and particularly of the important profit factor, the author deals in this article.

of management, for in most cases it is not possible to determine from a formula the extent of these indirect profits.

Maintenance charges today on old equipment are eating into profits to an astounding degree to say nothing of loss of use. Few firms have accurate records that determine the extent in each case of this truth. Down time on the machines that are out of service because of repairs, is costing many dollars in over-time work that is expensive, yet is rarely charged against the cost of keeping this old equipment. Savings in scrap loss, although given greater thought than some other indirect economies, are not as seriously considered as they should be, until the old machine has reached the stage where the loss is quite obvious and the department

foreman complains that the efficiency rating of his department is being affected. Increased productive accuracy of new tools greatly facilitates assembly and makes possible a better product. How many times have new product designs been changed from the perfection the engineers would like to something inferior, because the plant equipment will not maintain the necessary tolerances? Such benefits cannot be measured in direct dollar profits, but good judgment shown by management in considering its plant asset of machinery will determine that replacement is wise.

These indirect benefits, many of them intangible, if considered, will show that some machines should be replaced in cases where the direct return from cost cutting is small. Also with the proper consideration of all factors in replacement, many instances may be found where the replacement of a machine for intangible reasons should take place before that of a machine where the direct saving is exceedingly high.

A production unit that rates 70 per cent of its original efficiency, accuracy and dependability and which at its best rates 70 per cent of the ability of a modern unit, is actually only one-half as good as a new machine. This is way below the profit line in actual efficiency.

During the last three years our company has replaced approximately one-third of its investment in machine tools. The direct savings on some installations are quite large, while with others the gains

from replacing are to come entirely from the indirect and intangible benefits. We cannot say that through the indirect benefits we will gain a return of 20 per cent, because such replacements are based upon judgment rather than on accounting technique. We are certain, however, that because we have considered the matter in the light of both the direct savings and indirect benefits that our overall gain will be larger than otherwise and that we will be in a better position to combat the serious effects of rising costs.

Modern machine tools designed

with due consideration given to the operator's comfort, combined with adequate material-handling equipment, lessens fatigue and does much toward making the last few hours of the day as productive as the first. Also, with the greater productive accuracy of new equipment easier to obtain, less effort is required to maintain production, while holding limits and building operator's morale. Pride and interest are hence stimulated and greater cooperation obtained.

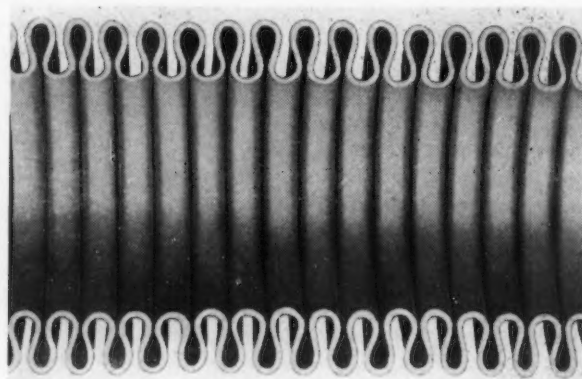
Regardless of labor or management's most earnest effort, production cannot be increased, accuracies

cannot be maintained nor profits shown without satisfactory equipment. It is important, in order to gain the most from such efforts, that some thought be given by management to provide these necessary modern tools.

Don't Generalize on Replacement

In considering replacement problems, it is inadvisable to generalize. With the possibility of direct savings, a cost analysis should be made for each machine. Indirect benefits should be considered separately and specifically for each installation.

Flexible Tubing From Strip



Strip after having been formed and welded is then corrugated as shown above.

FLEXIBLE metallic tubing produced from strip by means of autogenous welding has recently been developed by the Chicago Tubing & Braiding Co., Maywood, Ill. The welding method by means of which any desired length of tube can be formed overcomes the necessity of coupling short lengths such as could be made from tubes limited in length to transportation facilities. As a practical measure the tubes are usually formed in 150-ft. lengths, which after being corrugated result in continuous flexible tubes, each approximately 50 ft. long.

A wide range of metals is used, as for instance monel, bronze and steel. The bronze is of special composition free from zinc. The steel usually selected is of the rust resistant type in which carbon is held under 0.005 per cent. The re-

sulting tubes have a bending radius of approximately 10 times the internal diameter. The welding is of such quality that it is almost invisible, being flush with both surfaces of the tube, and it withstands the processes of forming either circular (annular) or spiral corrugations which may be either of the normal or narrow type. Corrugated tube sizes, all made from strip, range from 5/32 in. to 2 in. inside diameter.

The tube forming machine and welding apparatus are assembled as a unit. Strip mounted on a reel is formed into circular section by the usual guide method. At the end of the forming guide is a steel ring suited to the size tube being made so that the two edges which are to be butt welded remain a short distance apart as they pass to the flame. Mounted on the ma-

chine close to the delivery side of the ring are two water-cooled half collars which are so adjusted as to close the gap in the tube to the proper spacing, thus bringing the fused edges in contact. The gas burner, closely controlled by valves and necessary gages, is directed against the tube travel and the flame strikes slightly ahead of the water-cooled half collars. Neither fluxes nor welding metals are used.

The Weld is Swedged

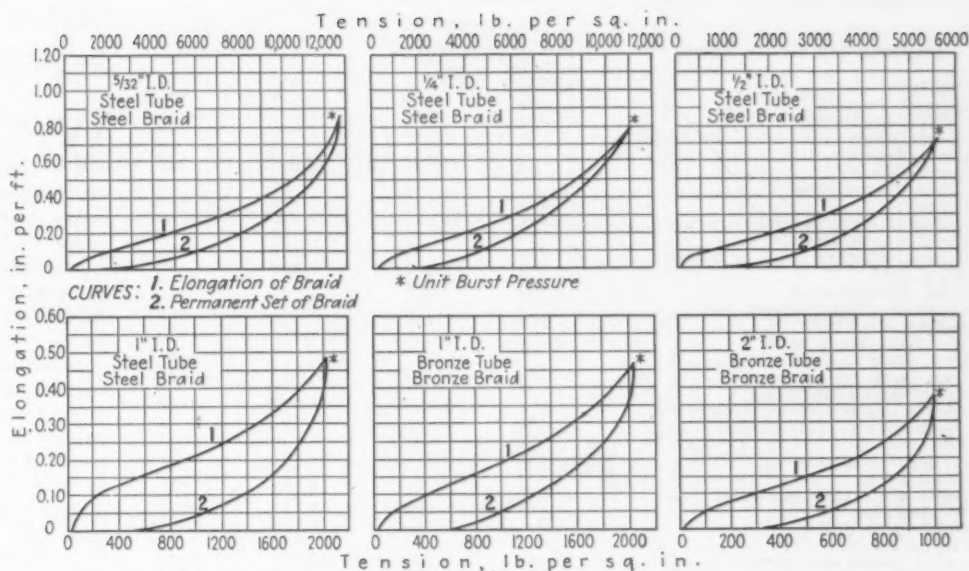
Immediately behind the half collars is a swedging hammer which strikes rapid blows on the weld. A mandrel is held inside the tube and a block beneath the tube forms support against the hammer blows. Following the swedger are six rollers, in pairs, which pull the tube through the machine at a predetermined speed. Strip thicknesses range from 0.011 in. to

0.024 in. Welding speeds range from 72 in. per minute for small diameter tubes to 33 in. on the larger sizes. At the end of the run out is an electric contact so that when the end of the tube strikes it a bell rings indicating that a 150-ft. length has been formed.

The annular corrugating machine performs two operations, the first of which forms annular rings, the metal being cold worked both ways from the mean diameter. This is accomplished by intermittently operated dies which are closed and opened and the metal is spun by means of eccentrics. As the tube advances through the machine it passes through two sets of compression dies. The first set clamps the tube and then moves forward to form a corrugation against the second die set, which has clamped and holds rigid the last formed corrugations. These operations also work from the mean diameter. Therefore, assuming the corrugation to be $\frac{1}{2}$ in. deep deviation from the mean is only $\frac{1}{4}$ in. and obviously less working and thin-

ning of the tube walls has been accomplished than when corrugations are formed their full depth either inside or outside the normal tube diameter.

After having been corrugated each tube is subjected to two tests, one being an air test wherein the tube is put under air pressure and then passed through water in order to spot leaks. The second test consists of putting the tube under hydraulic pressure to check strength and elongation.



Hydraulic tension tests show elongation of tubing with single beamed braid covering.

The accompanying charts show the results of various types and sizes of corrugated tubes, with single beamed braid covering, when subjected to hydraulic tension tests. For instance, a 1-in. steel tube has a bursting pressure of 2000 lb. per sq. in. Up to 500 lb. there is no permanent set of the braid. At 1400 lb. pressure the braid takes a permanent set of 0.10 in. per ft. and the elongation of the braid is about 0.28 in.

Steel Employment 577,000 in March; Payrolls Gain \$16,585,000 or 22%

AN increase of 21,000 employees during March brought the total number of employees on the payrolls of the steel industry to 577,000, a new high record, the American Iron and Steel Institute has announced. Total payments in wages and salaries, and average hourly earnings of steel workers, also rose sharply during the month to the highest levels in the history of the industry.

Employment in March showed a gain of 119,000 persons or 26 per cent over the 458,000 persons employed in 1929; and the same increase over March, 1936, when employment equaled the level of 1929. In the first three months of this

year, employment increased 40,000, or over 7 per cent.

Partly as a result of the general increase in wages and salaries which became effective on March 16, total payrolls of the industry for the month rose to \$90,863,000, a gain of 67 per cent over the total of \$54,400,000 for March, 1936. The March payrolls represented a gain of \$16,585,000 or 22 per cent over the total of \$74,278,000 paid by the industry in February, although the higher pay schedules were in effect for only approximately one-half of March.

Average hourly earnings of the 520,500 wage-earning employees on

the industry's payroll in March also increased sharply as a result of the mid-month rise in wage rates. The average for the entire month was 79.3c. an hr., against 72.8c. an hr. in February, 1937; 65.6c. an hr. in March, 1936; and 65.4c. an hr. in 1929.

Wage-earners worked an average of 42.5 hr. a week in March, the same number as in the preceding month. They worked 37.2 hr. a week in March, 1936, and 55 hr. in 1929. Since March 16, 1937, the steel industry has been generally paying for overtime work beyond 8 hr. a day or 40 hr. a week on the basis of one and one-half times the normal rate.

Average weekly wages in March amounted to \$33.70, against close to \$31 a week in the preceding month, and \$24.40 in March, 1936, the increase over one year ago being 38 per cent.

Imports (In Gross Tons)	March		Three Months Ended March	
	1937	1936	1937	1936
	1937	1936	1937	1936
Pig iron	10,720	23,743	34,494	53,436
Sponge iron	59	51	1,455	822
Ferromanganese ¹	4,108	2,345	8,028	5,501
Spiegeleisen	2,720	1,295	4,610	4,760
Ferrochrome ²	56	...	125	1
Ferrosilicon ³	42	85	275	222
Other ferroalloys ⁴ .....	...	...	52	...
Scrap	1,907	6,992	6,799	22,268
Pig iron, ferroalloys and scrap	19,612	34,511	55,838	87,010
Steel ingots, blooms, etc.	14	42	124	42
Billets, whether solid or hollow	220	45	456	168
Wire rods	1,631	1,039	4,231	5,205
Semi-finished steel	1,865	1,126	4,811	5,415
Concrete reinforcement bars	1,183	86	2,053	324
Hollow steel bars	255	134	618	469
Merchant steel bars	5,413	3,844	13,997	9,424
Iron slabs	1	...	1	...
Iron bars	157	77	422	388
Boiler and other plate	11	...	39	52
Sheets, skelp and saw plate	1,591	1,658	4,032	5,414
Die blocks or blanks, etc.	22	3	35	8
Tin plate	16	45	59	59
Structural shapes	8,650	4,477	23,331	12,268
Sheet piling	341	...	854	537
Rails and track material	847	334	2,504	851
Welded pipe	1,422	688	1,808	1,373
Other pipe	2,041	2,126	4,084	5,005
Cotton ties .....	...	59	349	59
Other hoops and bands	2,586	1,706	7,134	4,883
Barbed wire	1,297	2,032	3,802	6,154
Round iron and steel wire	595	331	1,373	1,203
Telegraph and telephone wire	2	26	8	27
Flat wire and steel strips	332	218	839	684
Wire rop and strand	334	268	758	626
Other wire	410	143	967	416
Nails, tacks and staples	1,991	2,604	4,866	7,392
Bolts, nuts and rivets	92	15	207	103
Horse and mule shoes	3	46	49	88
Rolled and finished steel	29,592	20,920	74,189	57,797
Malleable iron pipe fittings	26	7	89	11
Cast iron pipe and fittings	303	32	707	32
Castings and forgings	404	124	859	302
Total	51,802	56,720	136,493	150,567

¹ Manganese Content. ² Chrome Content. ³ Silicon Content. ⁴ Alloy Content.

Exports (In Gross Tons)	March		Three Months Ended March	
	1937	1936	1937	1936
	1937	1936	1937	1936
Pig iron	14,435	260	44,882	497
Ferromanganese and spiegeleisen	59	...	150	8
Other ferroalloys	133	110	561	530
Iron and steel scrap	355,979	163,295	568,060	454,459
Tin plate scrap	2,596	2,544	6,938	6,318
Waste-waste tin plate	3,674	1,614	11,371	5,733
Pig iron, ferroalloys and scrap	376,876	167,823	631,962	467,545
Ingots, blooms, billets, sheet bars	3,557	969	12,155	1,378
Ingots, alloy steel incl. stainless	525	...	632	...
Skelp	5,964	919	10,272	3,256
Wire rods	3,057	4,042	8,016	9,767
Semi-finished steel	13,103	5,930	31,075	14,401
Bars, plain and reinforcing	9,687	3,855	21,599	12,026
Bars, alloy steel	523	...	1,430	...
Bars, stainless steel	11	...	66	...
Iron bars	294	78	463	271
Plates, plain and fabricated	27,248	4,734	49,455	13,509
Plates, alloy steel	96	...	207	...
Plates, stainless	6	...	11	...
Sheets, galvanized steel	5,441	3,773	14,671	13,472
Sheets, galvanized iron	509	66	1,619	294
Sheets, black, plain steel	18,303	14,538	44,722	32,660
Sheets, alloy steel	18	...	81	...
Sheets, stainless	47	...	139	...
Sheets, black iron	833	723	1,807	1,974
Hoops, bands, strips, plain steel	8,380	4,604	23,234	13,925
Hoops, bands, strip steel, alloy	124	...	420	...
Hoops, bands, strip steel, stainless	56	...	154	...
Tin plate and taggers' tin	23,484	23,444	67,748	54,335
Terne plate (including long terne)	831	193	1,899	829
Structural shapes, plain material	16,169	3,840	27,225	11,068
Structural material, fabricated	3,991	2,474	8,923	4,321
Sheet piling	667	439	1,748	853
Tanks, steel	4,781	3,147	6,291	7,503
Steel rails	18,543	8,073	27,445	16,511
Rail fastenings, switches, spikes, etc.	1,497	911	3,067	2,475
Boiler tubes	1,216	531	2,958	1,335
Casing and oil line pipe	11,780	1,510	25,638	5,201
Pipe, black and galv., welded steel	2,708	881	9,401	5,514
Pipe, black and galvanized, welded iron	318	267	1,015	763
Plain wire	6,179	3,547	14,133	10,499
Barbed wire and woven wire products	3,904	2,946	10,661	7,392
Wire rope and other products	1,408	617	3,271	2,062
Nails and tacks	3,166	811	6,401	2,637
Bolts, nuts, rivets and washers, except track	1,002	540	2,595	1,449
Other finished steel	208	134	614	453
Rolled and finished steel	173,428	86,676	381,111	223,331
Cast iron pipe and fittings	2,860	1,762	9,068	3,203
Malleable iron screwed fittings	423	252	1,013	660
Car wheels and axles	1,884	704	3,576	1,355
Castings, iron and steel	1,354	763	3,509	2,941
Castings, alloy steel, incl. stainless	128	...	371	...
Forgings, plain	430	427	1,325	1,341
Forgings, alloy steel, incl. stainless	90	...	245	...
Castings and forgings	7,169	3,908	19,107	9,500
Total	570,576	264,337	1,063,255	714,777

First Quarter Imports at 1936 Level

WASHINGTON, May 10.—Although March imports of iron and steel products (excluding scrap) into the United States amounted to 49,895 gross tons, valued at \$2,420,133, and forged sharply ahead (26 per cent in quantity and 45 per cent in value) of the February totals of 39,157 tons and \$1,671,272, the first quarter aggregate of 129,694 tons, valued at \$5,807,729, compares closely with the 128,299-ton trade valued at \$5,124,574 in the corresponding period last year, according to a preliminary report of the metals and minerals division, Bureau of Foreign and Domestic Commerce.

Pig iron was the leading product imported in March, 10,720 tons having come mostly from the Netherlands, British India, and Canada. Next in tonnage was structural shapes, the outstanding suppliers being Belgium and France.

In the first quarter the leading items imported were pig iron, structural shapes and merchant steel bars.

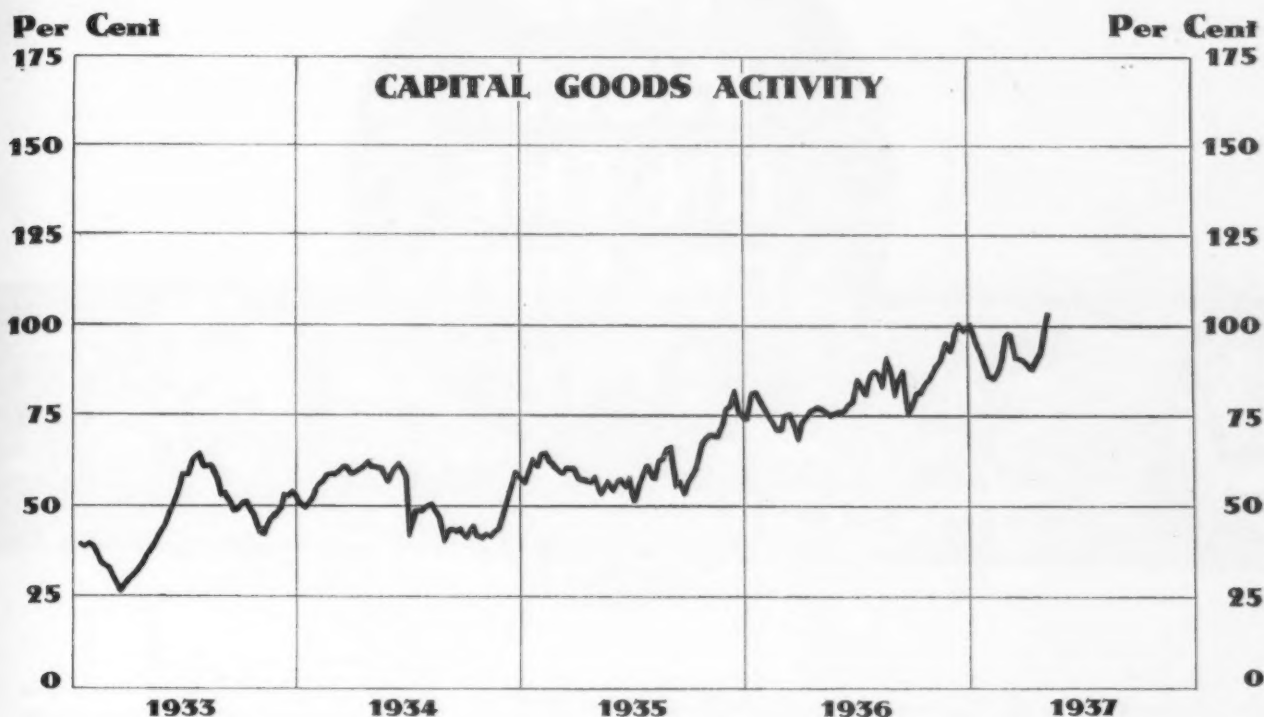
An analysis of the export data appeared in last week's issue on page 86.

United States Imports of Pig Iron by Countries of Origin

	March		Three Months Ended March	
	1937	1936	1937	1936
	1937	1936	1937	1936
United Kingdom	50	...	50	1,082
British India	4,542	4,503	15,809	13,192
Germany	60	59	310	2,535
Netherlands	4,580	15,029	10,564	27,521
Canada	1,488	777	2,705	1,185
France .....	...	...	...	...
Belgium .....	...	...	...	529
Norway	660	275	1,007	...
Sweden	164	200	164	...
Russia	2,551	4,581	6,271	...
All others .....	...	...	...	...
Total	10,720	23,743	34,494	53,436

March Imports of Iron and Manganese Ores

	Iron Ore		Manganese Concentrates, 35 Per Cent or Over	
	1937	1936	1937	1936
	1937	1936	1937	1936
Canada	867	30	...	...
Cuba	45,000	22,000	9,072	2,320
Chile	128,700	86,125	...	...
Spain .....	...	50	...	...
Norway	34,117	19,444	...	...
Sweden .....	...	...	...	...
French Africa .....	...	...	...	...
Russia	5,110	...	14,358	4,378
India	845	...	3,408	8,845
Brazil .....	...	...	...	1,251
Gold Coast .....	...	...	14,025	6,637
Other countries	396	4,166	42	9
Total	215,035	131,815	40,905	23,440



THE IRON AGE Weekly Index Numbers of Capital Goods Activity
(1925-27 Average = 100)

Last week	103.6	Same week 1934	60.8
Preceding week	98.2*	Same week 1933	38.8
Same week last month	87.5	Same week 1932	36.3
Same week 1936	76.3	Same week 1931	69.7
Same week 1935	53.5	Same week 1930	99.5
		Same week 1929	123.7

* Revised.

ACTIVITY in the production and distribution of durable goods again showed a sharp gain last week, according to THE IRON AGE seasonally adjusted index. The index advanced 5.0 points from the preceding week to 103.6 per cent of the 1925-27 average, and is the highest figure reached since the middle of April, 1930. In 1936, the highest point on the index was touched in middle December when an average of 100.1 was scored. Last week, the gains recorded were chiefly in the two construction items, heavy and light. Engineering construction awards advanced in dollar volume 48 per cent over that of the preceding week, the principal advance being in public awards, which gained a corresponding 80 per cent. Private contracts increased 20 per cent. Car loadings of forest products, representing future activity in light construction, gained 28.5 per cent over the figure for the preceding week, on top of a 44 per cent gain the week before, bringing the figure up to the highest this

year and well over double the volume maintained rather consistently during the first three months.

Ingot production of the steel companies regained the amount lost the week before owing to threats of high water in the Wheeling and Pittsburgh districts. Automobile production declined a slight amount, but the figure seasonally adjusted showed a gain of a point. Only the Pittsburgh industrial index showed a marked loss, reflecting floods threats, since the figures lag a week behind others in the composite index.

	Latest Week	Change from Preceding Week
Steel production (per cent of capacity)	92.5	+1.5
Automobile production (number of cars and trucks)	141,275	-210
Railroad loadings of forest products (number of cars)	70,182	+15,486
Pittsburgh industrial production and shipments (index number)	102.3	-2.70
Construction contracts awarded (total value)	\$59,451,000	+\$19,205,000

Components of The Index (1) Steel Ingot Production Rate, from THE IRON AGE; (2) Automobile Production, from Ward's Automotive Reports; (3) Revenue Freight Carloadings of Forest Products, from Association of American Railroads; (4) Industrial Productive Activity in Pittsburgh District, from Bureau of Business Research of University of Pittsburgh; (5) Heavy Construction Contract Awards, from Engineering News-Record.

THIS WEEK ON THE ASSEMBLY LINE



... New General Motors plants and expansions revealed at Lockport, Syracuse, Anderson and Dayton as William S. Knudsen takes presidency.

o o o

... Third shift nearly out of existence in auto industry to increase efficiency and satisfy labor; expansions will help keep working hours down.

o o o

... Chrysler spending millions on new buildings and machinery; Plymouth project alone to cost more than million dollars.

o o o

... Murphy disclaims dictatorial intent in labor bill and says he will offer changes himself.

DETROIT, May 10 — Opportunity, with the induction of William S. Knudsen as the new president of General Motors Corp., much has been revealed concerning General Motors' huge expansion program for the year. Details of the expansion have been settled so rapidly in the last few days in Detroit that in one case, at least, property was purchased and rough figures set for building size and payroll before a name for the new division of the corporation had been thought out. One of the latest General Motors projects will be the erection of a single-story

steel and brick building, 185,000 sq. ft. of floor space, on a 65-acre plot west of Lockport, N. Y. This building, with a 520-ft. covered railroad dock for shipping purposes, is an expansion of the Harrison Radiator division. Thermostats, car heaters, heat exchangers and radiators will be manufactured in the new plant.

A heavy spending program is under way at Syracuse, N. Y., where the Brown-Lipe-Chapin plant of the Guide Lamp division will be more than tripled in usable floor area. At present, only the first and part of the second floors

are being used, but as rapidly as possible equipment is being put in to use all the floors up to and including the fifth for the manufacture of steering gears, head lamp parts, bumper guards and hub caps. Manufacture of steering gears in this plant is a new operation. Two thousand units a day will be produced for Eastern assembly plants of Chevrolet, Pontiac, Oldsmobile and Buick. Employment will be 1200, three times the figure anticipated when the plant was opened in January, 1936.

Other recent developments of this sort in General Motors include two projects at Anderson, Ind., one involving 32,000 sq. ft. of additional building space for the Guide Lamp division there and the other a new Delco-Remy plant of 144,000 sq. ft., to be erected on a recently purchased 60-acre plot. At Dayton, Ohio, the corporation is spending nearly \$500,000 for 95,000 sq. ft. of manufacturing and office space for Moraine Products division. This unit is now occupying space which will be used, when vacated, by Delco Products.

\$40,000,000 Program

Tuesday, shortly after he took office, Knudsen discussed plans for the future of the corporation, revealing the \$40,000,000 expansion program and predicting that all of the new facilities would be in use shortly after the first of the year. Tight spots in the line, he said, were being taken care of by additional equipment not only to increase production capacity, but to do so within the corporation's established maximum of 45 hr. per



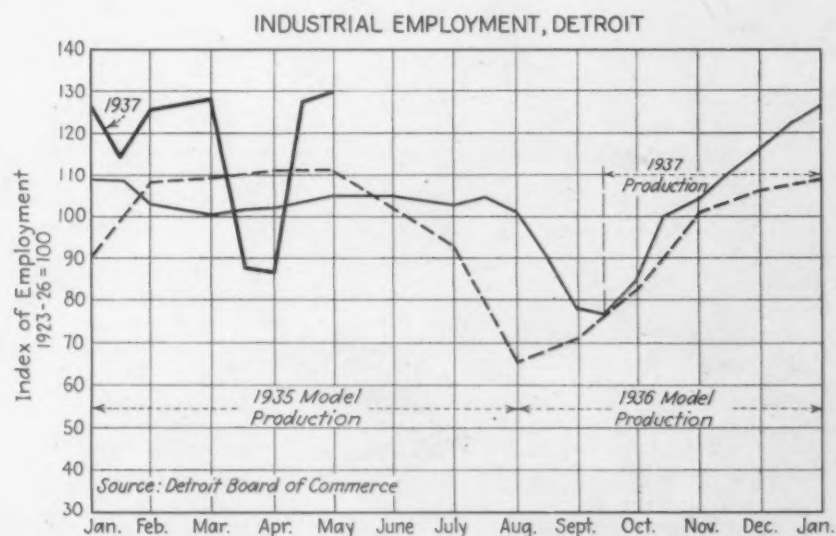
week. This means that at the peak, the corporation will be paying for 5 hr. per week overtime under the present 40-hr. agreement with the UAW. Another reason for much of the increased capacity, Knudsen admitted, was the fact that the third shift, generally from midnight to eight in the morning, was being eliminated for a number of reasons, among them the fatigue factor, increasing efficiency and labor antipathy toward the so-called "graveyard" shift. General Motors' policy is to avoid this shift except in departments where there is a bottleneck now in production or where continuous processes, such as pouring in foundries, are going on. His explanation of the industry's long use of this third shift is that many companies failed to consider the inefficiency of it, to weigh it against the advantages of expansion, or lacked the courage to expand facilities.

There is a divided opinion on the future of general markets, he declared, but expressed belief that the automobile market undoubtedly would hold up through the next year. He predicted that, labor troubles being avoided for the rest of the year, General Motors will produce more than 2,000,000 cars in 1937, compared with 1,861,540 in 1936 in the United States and Canada. Reviewing the improvement in the automobile industry since the end of the depression, the new top executive expressed pride in the record that has been made in taking up the slack in the curve of seasonal unemployment. With the change in Auto Show date,

there was a 51 per cent improvement in General Motors' record. In producing parts and in assembling, the peak has been knocked off as far as number of hours per week is concerned and the low spot in the employment roll has been filled up. The lowest figure at any time in 1936, he said, was about 118,000 men for a short period during model change-overs, and the highest was 230,000. Production of the present 1937 cars, he said, will continue well into September, probably at peak production through July, much later than usual. The period for change-over to build the new designs will be much shorter than the six weeks frequently taken.

The change that brought Knudsen into office as president was not a real surprise in Detroit, because

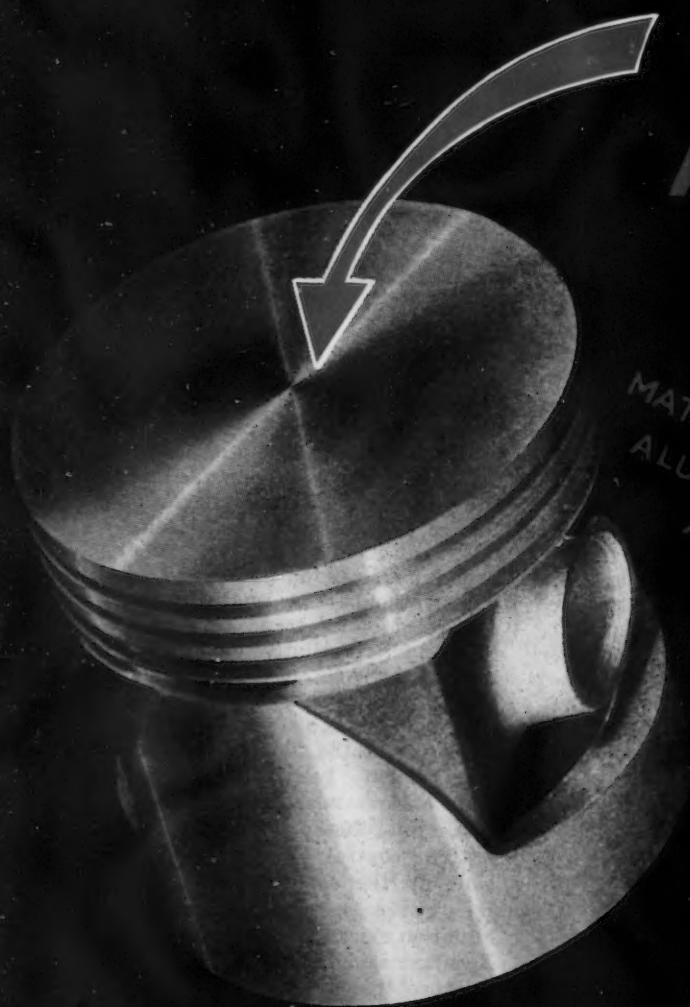
for a long time he has been pointed to as a logical choice to head up the company's production facilities as president. The organization change that accompanied his election, that is, the establishment of two committees, on policy and administration, is in line with the General Motors' trend to operate through legislative committees rather than through department heads or divisional heads. Knudsen confirmed this viewpoint, asserting that the old truism about "two heads being better than one" still stands. Asked whether this final step toward committee control would tend to slow up the corporation, particularly when a rapidly developing situation exists, as in labor trouble, Knudsen said that he "hoped not." Because this system of control is



Turning Pistons

NOTE:—

**Completely
Faced**



MATERIAL
ALUMINUM
ALLOY



CAN YOU DO THIS?

- 1 — Load
- 2 — Rough turn
- 3 — Semi-finish turn
- 4 — Rough groove

- 5 — Rough face and chamfer
- 6 — Finish face and semi-finish groove
- 7 — Finish turn
- 8 — Finish Groove

ALL IN 14 SECONDS?

The Bullard Type "J-7" Multi-Au-Matic does this and provides 218 pistons per hour.

All in all, compare the facts — quality of finish and time element — then select your

manufacturing equipment.

Let Bullard Engineers Estimate on your jobs. Time Saved is Money Earned. Send us your prints or samples NOW.

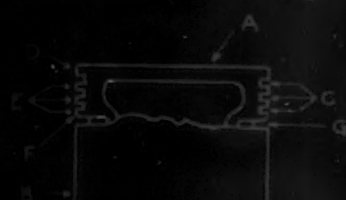
THE BULLARD COMPANY

in 1/4 Seconds
with

BULLARD *MULT-AU-MATIC*

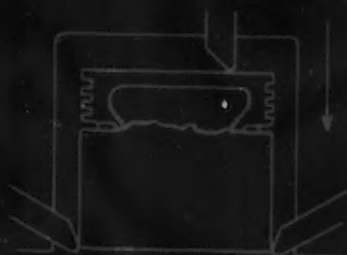
TYPE J-7

STATION 1 LOADING

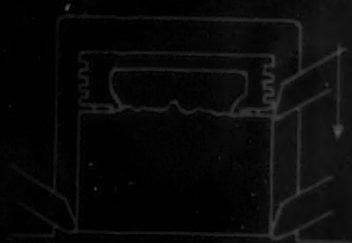


POWER OPERATED FIXTURE

STATION 2
PLAIN VERTICAL HEAD



STATION 3
PLAIN VERTICAL HEAD



STATION 4
PLAIN COMPOUND HEAD



STATION 5
PLAIN COMPOUND HEAD



STATION 6
PLAIN COMPOUND HEAD



STATION 7
PLAIN VERTICAL HEAD



STATION 8
GROOVING HEAD



BRIDGEPORT, CONNECTICUT

so pronounced in General Motors, it is going to be interesting to watch its operation. In addition, the election of Knudsen does, in a sense, return to Detroit the direct control of corporation activities. Knudsen announced that he would adhere to his former practice of spending most of his time in this city, with only three or four days a month in the East.

Higher car prices in 1938 are inevitable, Knudsen believes. Materials are now going so high—hand-in-hand with increased labor rates—that car makers cannot avoid extra charges much longer, even by “forward buying,” he said. Tying this in with the question of the possibility of an annual wage for shop workers, he said: “If you can guarantee me an annual sale, I can guarantee you an annual wage.”

And as for the human side of the news, Knudsen provided a bit of that the next day when he said of Flint, Mich., and his former connection as president of the Chevrolet Motor Co. there: “Flint has been good to me. Part of what I have was made there. I want to give some of it back.” So, to do honor to his wife, who has borne him four children, he established the \$250,000 Clara Elizabeth Foundation for maternal and infant care.

Chrysler Expansion

The General Motors expansion, which follows fast on announcement that the Ford Motor Co. is to experience more growing pains, is to be paralleled by an important Chrysler Corp. expansion in both the United States and Canada. Aside from the Chrysler-Windsor project for the manufacture of engines in Canada, there will be

million-dollar projects at Chrysler-Jefferson, already revealed, and at Plymouth, still to be announced. Construction on all of these will start about June 1 and will be pushed ahead as rapidly as possible, looking to completion for operation by September. The Windsor job will cost \$2,500,000, of which \$150,000 will be for a new 115,000-sq. ft. building, where 500 or 600 more men will be employed. The rest of the money goes principally into equipment, most of it already ordered, for machining engine parts. Production will be 25 an hour, making shipment of engines from the United States unnecessary. The Jefferson Avenue building additions, one on each end of the huge machine shop, will add 77,500 sq. ft. and will cost \$290,000 for building, another \$750,000 for equipment, plus \$100,000 for rearranging present machines.

Plymouth, with a new transmission in the making, will spend \$800,000 for general equipment and another quarter million dollars to add 71,500 sq. ft. of floor space. Rounding out the facilities at DeSoto, the corporation will expend \$272,000 for a third story addition for body and paint shop and \$85,000 for a welfare building, housing employment personnel, hospital and similar units.

Production at Peak

Meanwhile automobile production continued apace, with 141,275 produced in the week ended May 8, according to Ward's Automotive Reports. Fluctuations in various plants accounted for the drop from 141,485 of the previous week, and General Motors' sit-downs at Chevrolet and Fisher Body, St. Louis, caused some hold-up in assemblies of cars. In general, it is felt that

automobile production and the employment level in Detroit have practically reached their peak, to hold the present levels rather consistently through May and June, with the first slight tapering off in July. As is apparent from the fact that many firms are ready to begin die try-outs (Packard's tests are said to be already under way) the pressure to build new models will be felt earlier than usual this year; the expansions that are getting under way indicate that the pressure, when it is felt, will be noticeable particularly among those who supply the industry with steel sheets and strip, as well as other materials.

Murphy's Labor Bill

Governor Murphy's proposed labor law is not getting the kind of strong support from him that might be expected. Almost before copies of the bill were in the hands of legislators, objections to the anti-strike features were heard from labor groups and protests were being made by industrialists against the clauses which permitted seizure of property. Murphy, disclaiming that the measure is dictatorial in intent, countered immediately with declarations that he had offered the bill merely as a frame work. Changes were anticipated, Murphy said, adding, “I have some changes in mind myself, but they are not quite ready.” Then to offset heavy criticism of the sections called dictatorial, Murphy announced Friday that these sections may be deleted with his consent. No effort has been made yet by the House Labor Committee to consider the Governor's bill, the law makers apparently waiting for complete expression of public opinion before they act.

SUB-ASSEMBLY lines feed the chassis assembly lines in auto factories. In the new De Soto plant in Detroit rear axles, independent front springing units, covered, taper-leaf springs and chassis frames flow to the main line. Each rear axle assembly seen in this picture is carried on the conveyer by a dolly while workmen put in the gears, bearings, shaft and install the brakes. Tools and fixtures are suspended within reach.



Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	March, 1937	February, 1937	March, 1936	Three Months, 1936	Three Months, 1937
Raw Materials:					
Lake ore consumption (gross tons) ^a	5,142,496	4,443,306	2,897,867	8,481,741	14,280,114
Coke production (net tons) ^b	4,849,363	4,283,681	3,366,665	10,110,549	.....
Pig Iron:					
Pig iron output—monthly (gross tons) ^c	3,459,473	2,999,218	2,040,311	5,889,902	9,670,191
Pig iron output—daily (gross tons) ^c	111,596	107,115	65,816	64,724	107,447
Castings:					
Malleable castings—production (net tons) ^d ...	67,521	57,295	45,536	134,345	.....
Malleable castings—orders (net tons) ^d	68,525	60,187	48,008	130,138	.....
Steel castings—production (net tons) ^d.....	.....	92,678	51,674	143,926	.....
Steel castings—orders (net tons) ^d.....	.....	95,693	71,341	182,061	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons) ^e	5,229,431	4,424,659	3,342,619	9,352,983	14,390,787
Steel ingot production—daily (gross tons) ^e ...	1,180,458	1,106,165	754,542	719,460	1,119,035
Steel ingot production—per cent of capacity ^e	90.13	84.46	57.61	54.93	85.44
Finished steel:					
Trackwork shipments (net tons) ^e	10,720	8,153	6,258	13,740	26,119
Sheet steel sales (net tons) ^f.....	.....	.....	251,818	564,867	.....
Sheet steel production (net tons) ^g.....	.....	.....	207,820	622,179	.....
Fabricated shape orders (net tons) ^h	182,049	88,946	108,826	370,133	401,646
Fabricated shape shipments (net tons) ^h	131,691	91,848	107,687	265,885	315,559
Fabricated plate orders (net tons) ^d	68,899	30,340	30,437	97,009	.....
U. S. Steel Corp. shipments (tons) ^b	1,414,399	1,133,724	783,552	2,181,281	3,698,041
Ohio River steel shipments (net tons) ⁱ	122,100	88,170	116,510	196,052	306,670
Fabricated Products:					
Automobile production, U. S. and Canada ^k	*518,715	383,637	438,992	1,117,172	1,301,681
Construction contracts, 37 Eastern States ^l	\$231,245,900	\$188,257,300	\$198,761,900	\$553,973,800	\$662,347,200
Steel barrel shipments (number) ^d	995,407	724,738	660,551	1,720,572	.....
Steel furniture shipments (dollars) ^d	\$2,515,169	\$2,071,847	\$1,585,800	\$4,656,391	.....
Steel boiler orders (sq. ft.) ^d.....	.....	871,746	589,676	2,023,427	.....
Locomotive orders (number) ^m	29	33	13	73	108
Freight car orders (number) ^m	6,200	10,532	627	8,913	27,613
Machine tool index ⁿ	211.6	165.2	105.3	†109.4	†192.4
Foundry equipment index ^o	294.2	249.5	115.0	†117.4	†244.8
Foreign Trade:					
Total iron and steel imports (gross tons) ^p	51,802	41,628	56,720	150,567	136,493
Imports of pig iron (gross tons) ^p	10,720	11,340	23,743	53,436	34,494
Imports of all rolled steel (gross tons) ^p	31,457	23,134	22,046	63,212	89,000
Total iron and steel exports (gross tons) ^p	570,576	290,987	264,337	714,777	1,063,255
Exports of all rolled steel (gross tons) ^p	186,531	115,335	92,606	237,719	412,186
Exports of finished steel (gross tons) ^p	173,428	104,007	86,676	223,318	381,111
Exports of scrap (gross tons) ^p	355,979	143,197	163,295	469,366	568,060
British Production:					
British pig iron production (gross tons) ^r	680,300	603,700	633,600	1,813,800	1,934,700
British steel ingot production (gross tons) ^r	1,109,500	995,900	980,100	2,831,100	3,104,300
Non-Ferrous Metals:					
Lead production (net tons) ^s	43,642	37,451	35,150	105,573	124,729
Lead shipments (net tons) ^s	63,425	50,375	36,743	104,419	159,518
Zinc production (net tons) ^t	53,202	37,794	42,411	120,209	131,043
Zinc shipments (net tons) ^t	59,635	46,953	38,087	124,274	157,815
Deliveries of tin (gross tons) ^v	9,080	7,675	5,520	17,755	24,370

† Three months' average. * Preliminary.
Source of figures: ^a Lake Superior Iron Ore Association; ^b Bureau of Mines; ^c THE IRON AGE; ^d Bureau of the Census; ^e American Iron and Steel Institute; ^f National Association of Flat-Rolled Steel Manufacturers; ^g American Institute of Steel Construction; ^h United States Steel Corp.; ⁱ United States Engineer, Pittsburgh; ^j When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of Census; ^k F. W. Dodge Corp.; ^l Railway Age; ^m National Machine Tool Builders Association; ⁿ Foundry Equipment Manufacturers Association; ^o Department of Commerce; ^p British Iron and Steel Federation; ^q American Bureau of Metal Statistics; ^r American Zinc Institute, Inc.; ^s New York Commodities Exchange.

WASHINGTON.



... *Interdepartmental Commercial Policy Committee will report soon on scrap export bill*

.

... *Opponents of measure seek to include pig iron and finished steel; an effort also to include copper*

.

... *Secretary Ickes follows his former procedure of awarding Government job to mill farther away from destination*

By L. W. MOFFETT

*Resident Washington Editor,
The Iron Age*

.

WASHINGTON, May 11.—The report of the Interdepartmental Commercial Policy Committee on the Schwellenbach-Kopplemann bill to license exports of steel scrap is expected to be made within a few days. It was asked for by Senator Schwellenbach soon after he introduced his bill. At his office it was stated that he will not take any action on the proposed legislation until he has received the report from the committee, which is made up chiefly of Cabinet members. Upon receipt of the report, Senator Schwellenbach likely will arrange for hearings before the Senate Committee on Military Affairs. Because of the sharp differences between steel and castings producers who are urging and scrap dealers who are opposing the legislation, the hearings likely will be lively.

Prospects of passage or defeat of the legislation, however, are ex-

pected to rest with the nature of the report of the interdepartmental committee, which will be considered as reflecting the administration policy. As yet it has not indicated its policy. While there are said to be differences of opinion in the committee, the controlling view, it is said, will be that of Secretary of State Hull.

This is due to the fact that, while conservation is given as one reason for the legislation, its enactment also is being urged on the ground that the large scrap exports are being used for purposes of rearmament. Manifestly, the question concerns the State Department more directly than it does other Government departments. The State Department also has charge of negotiating and administering reciprocal tariff agreements, and to this end naturally encourages as far as practicable a free flow of international trade. So, while on the question of armament it conceivably would like to see scrap exports curtailed, it would seem it would take an opposite attitude in connection with its reciprocal tariff policy. Perhaps the answer is that it will govern itself by its opinion

as to the importance of the two questions, shaping its policy on which it believes to be the weightier.

Bill To Be Re-drafted

The Schwellenbach-Kopplemann bill will be broadened and re-drafted. As it now is drawn, it is patterned after the tin plate scrap act and merely substitutes the word "steel" for "tin" so that it affects only steel plate scrap. Proponents of the legislation have drawn a bill which would apply to all iron and steel scrap as classified by the Bureau of Standards. It is reported that both Senator Schwellenbach and Representative Kopplemann are agreeable to the broadened bill.

Opponents of the measure, on the other hand, are prepared to insist upon much greater expansion of the bill, some apparently with the purpose of loading it down so heavily that it will be defeated, should it come to a vote in Congress. Particularly in mind is an effort to include pig iron and probably all raw, semi-finished and finished steel. The point they seek to make is that exported steel, like

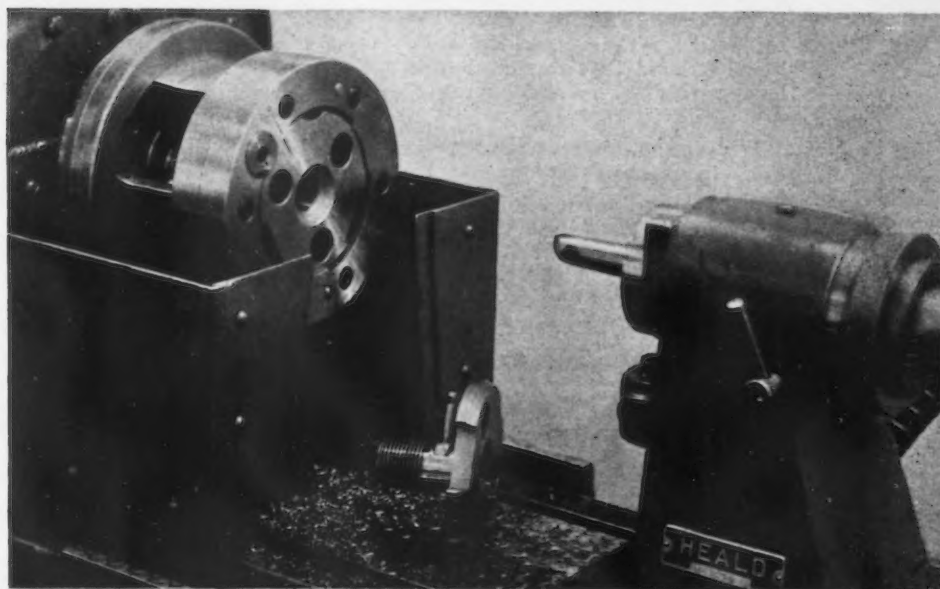
Cylinders

PRECISION FINISHED

on Heald BORE-MATICS

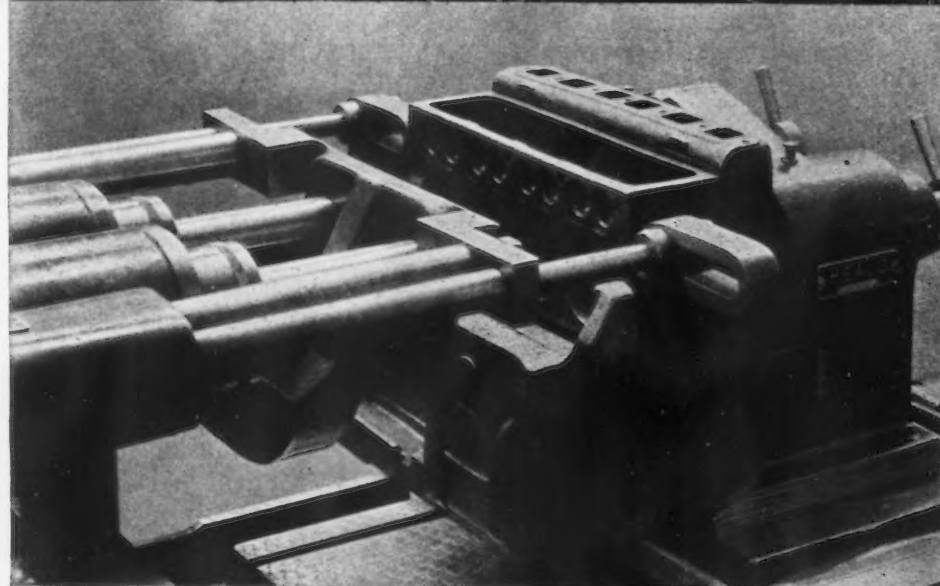
$\frac{7}{8}$ INCHES

Every type and size of cylinder can be precision finished on a Heald Bore-Matic. This ranges from the opposite tiny miniature engine cylinder (see cylinder attached to loading plate on table) with only $\frac{7}{8}$ " bore, 1" stroke, ideally handled on our No. 48 Bore-Matic, to a straight-8 automobile or large diesel engine cylinder.



$\frac{1}{4}$ INCHES

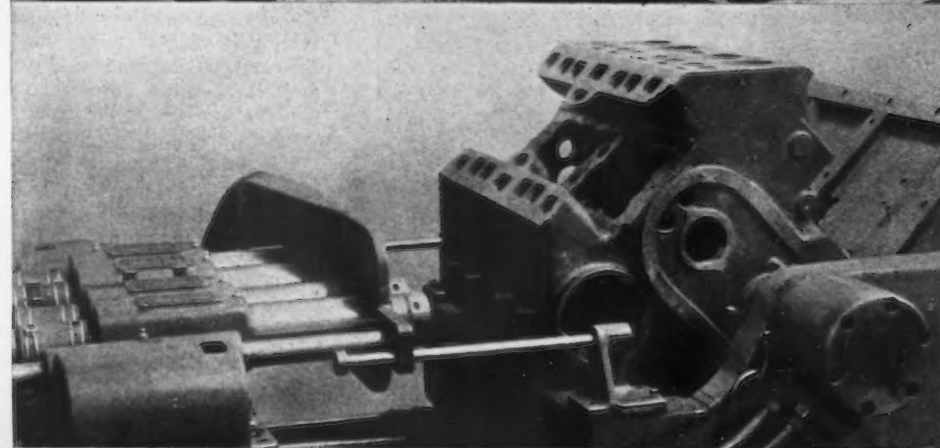
European manufacturers of small cars find the Heald No. 48 Bore-Matic ideal for precision finishing the cylinder blocks. Opposite, this machine is finishing two bores at a time with hydraulic indexing between each set of holes $2\frac{1}{4}$ " diameter spaced $2\frac{5}{8}$ " apart. Large size blocks, however, are better handled on larger Bore-Matics such as shown below.



$\frac{1}{2}$ INCHES

Here a No. 45 Bore-Matic is precision finishing a V8 automobile cylinder block. One side is precision bored, the block reversed and the other set of holes precision finished.

On a straight-8 this same machine is arranged to finish bore all 8 holes at a single pass of the tool.



Heald MACHINE COMPANY, Worcester, Mass., U. S. A.

scrap, also is being used to rearm foreign countries. Further, they contend; if it is to be argued that scrap exports should be restricted as a matter of conserving raw material supplies, a like point can be made with regard to the desirability of curtailing exports of steel inasmuch as steel is the product of raw materials also and is the forerunner of scrap. The plan to include pig iron in the proposed legislation is based on the additional ground that foreign buyers have turned to heavier buying of American pig iron.

While proponents of the legislation to restrict scrap exports brand as absurd and perhaps do not take seriously the arguments for restricting steel and other exports, there is no question that

moves in this direction are gaining force.

Effort To Restrict Copper Exports

That this is true is evidenced by an effort to restrict exports of non-ferrous metals, especially copper. Some of the smaller fabricators of copper are reported to be proposing licensing legislation to restrict exports of copper, scrap, ingots and rolled copper. They point to the rising prices they have to pay for their raw copper supplies, which, it is maintained, put them at a disadvantage with integrated competitors, whose production begins with the ore, and say that the increased costs are due partially to the sharp growth of exports, also said to be going abroad largely in connection with

rearmament programs. The conservation argument likewise has been advanced in connection with copper ore, scrap and manufactures. It has been pointed out that copper exports by value in the first quarter of the present year have increased more than 100 per cent over exports during the corresponding period of 1936, rising to a value of \$20,837,532 from \$10,205,873. Reply to these arguments for restricting exports of copper as a matter of conserving raw materials is made by the statement that the great bulk of copper exports is the product of imported ore, brought to the United States and made into finished products. The costs are cut, since the producers are allowed a drawback of 99 per cent of the duty on the ore.

Conceivably, too, efforts may be made to go far beyond metals with regard to licensing exports. Based on the matter of rearmament, it has been pointed out that munitions include almost every possible product, an outstanding example of which is cotton. To make an effort to restrict cotton exports obviously would meet with vigorous opposition from members of Congress from the South. Steps of this kind, it is pointed out, would, if not controlled, arrive at a point of widespread regimentation of American export trade, either under the Munitions Control Board or the recently enacted neutrality law.

EQUALLY VALUABLE . . . for the tool room or many types of Production Work!

Production Executives who want to cut the cost and improve the quality of their grinding operations, should give every possible consideration to this new automatic 24"x8"x12" machine.

THE ABRASIVE 3B SURFACE GRINDER



is fast, accurate and powerful beyond all previous standards for machines of this type and size—and embodies the highest standards of modern design, material and workmanship throughout. Money-saving advantages include:

Greater Speed because of its two-speed transmission—and because the shock of table reversal is eliminated by an oil shock absorber built into the transmission case.

Greater Precision because of the heavy one-piece well-ribbed deep saddle, heavy spindle, and practical elimination of vibration.

Greater Durability because the spindle is 1½" diameter, made of chrome steel, hardened and ground, and fitted to an adjustable phosphor-bronze box at the front, with super-precision ball bearings at rear.

Complete information, together with estimates as to the savings to be effected by its use under any given conditions, will be furnished promptly on request.

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To Amend Tin Plate Scrap Export Act

Meanwhile, Representative Hoffman, of Michigan, has offered an amendment to broaden the tin plate scrap act. It would call for the licensing of "other scrap containing tin together with drosses." Its passage would mean the application of an export quota system to such material as used babbitt metal, tin foil, tooth paste tubes and similar small tin containers. In Florida, the concern over preserving scrap supplies has resulted in the introduction of a bill in the State Legislature which would put an export tax on shipments out of the state. The violence the bill would do to the United States Constitution, if that counts, leads to the belief that it reflects a political gesture only.

Business booked by the Blaw-Knox Co., Blawnox, Pa., and its subsidiaries in the first four months of 1937 was twice that of the corresponding period in 1936, according to William P. Witherow, president. The volume of business was the greatest for this period of any year since 1930.

Battleship Bids Postponed to June 17

WASHINGTON, May 11.—The Navy Department has postponed from June 2 to June 17 the date for opening bids for the construction of a battleship to be built in a private yard. It will require about 27,000 tons of steel, most of which will consist of armor and protective armor deck plates. Medium steel requirements will be about 8500 tons.

On June 16 bids will be opened for the construction in private yards of two submarines, which with two other submarines to be built at Navy Yards, and eight destroyers are provided for in the recently passed naval act. No date has been set for opening of bids for construction of the destroyers, four of which will be built in private and four in navy yards.

Perkins Dismisses "Discrimination" Case

WASHINGTON, May 11.—Secretary of Labor Frances Perkins has handed down a decision in which she said authority vested in her by the plan of employee representation of the Sharon Steel Corp., Lowellville, Ohio, does not give her jurisdiction to pass on a complaint of Thomas Black, former employee, who said he was discharged because of his activities with the Committee of Industrial Organization. The company said Black was discharged because of poor workmanship on a job last December. Black also was a representative of the employee representation plan.

In dismissing Black's petition for review of the action of the steel company, Miss Perkins accepted as her own the finding and recommendation of Donald Hiss, assistant solicitor of the Department of Labor. Miss Perkins disclaimed jurisdiction because the alleged discrimination was not directed against Black on account of his official acts as a representative of the plan. She said that the section of the employee representation plan providing for appeals to the Secretary of Labor did not cover cases of alleged discrimination inflicted because a representative joined an independent union. The company had asked for dismissal of the petition as it denied that Black had been discharged because of his activities

with the CIO. It was upheld in its contention that the Secretary did not have jurisdiction as affiliation with an outside union was not an official duty of a representative.

Miss Perkins suggested that Black could appeal to the National Labor Relations Board on the ground that his dismissal constituted an unfair labor practice in violation of the Wagner Act.

Ickes Awards Job to Most Distant Mill

WASHINGTON, May 11.—Sticking to his policy of awarding contracts in identical bidding to the producer whose plant is

located the most distant from the site of construction, Secretary Ickes last Friday announced that he has let a contract of \$77,250 for 2,942,685 lb. of reinforcing concrete bars to the Carnegie-Illinois Steel Corp., to be shipped from its Duluth, Minn., plant to Grand Coulee dam, near Odair, Wash. The other bidders were the Bethlehem Steel Corp., San Francisco, and the Colorado Fuel & Iron Corp., Minnequa, Colo.

Mr. Ickes enjoys "irking" steel companies whose plants are nearest the site of construction by turning down their bids, or at least he said his practice is beginning to irk the Western concerns. Also he says the practice gives advantage to the railroads, an advantage, he declared, which is denied the Government under the system of so-called "collu-




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sive bidding." Further enjoyment apparently is taken by Mr. Ickes in ignoring a ruling of some months ago by the Comptroller General. The Comptroller General had told Mr. Ickes that in case of identical bids, the successful bidder was to be determined by drawing lots. Mr. Ickes, sniffing at the ruling, said that the award of contracts over which he had control is an administrative matter. So he has continued to disregard the ruling.

"I have consistently opposed the practice of identical bidding since it defeats the purpose of the Government in offering its work in the open market for free and open competition," said Secretary Ickes in announcing the Carnegie-Illinois award.

"In this instance I have followed

the practice which I began some time ago as a means of protesting against collusive bidding and the bidder farthest removed from Odair, Wash., got the contract. It will have to give the railroads the advantage it refused the Government.

"There was a time when it was practically impossible to get anything but identical bids on steel and cement. I take pride in the fact that now for many of our contracts bona fide competitive bids are received. The evil of identical bidding has not been entirely eliminated, but the practice of awarding the contract to the firm which ships from the most distant point is beginning to irk the Western concerns. They are finding that identical bidding places them at a disadvantage."

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Battleship Parts Can Be Sold Abroad

WASHINGTON, May 11.—The recently passed Neutrality Act does not appear to prohibit the sale of battleship parts, according to State and Navy Department officials whose advice on the subject, it was stated, was asked by two American steel companies. It is reported that the Soviet Union is considering early buying of battleship parts, to be packed and shipped to Russia for assembly.

Movie of World's Largest Bridge

WASHINGTON, May 11.—The S. R. O. sign was hung out last Wednesday night when about 1200 persons, including prominent Government officials, crowded the Department of Commerce auditorium in Washington and saw a dramatic reel as it showed the construction of the 8¼-mile San Francisco-Oakland Bay Bridge. Combined with this first Washington presentation of this splendidly executed sound moving picture was an interesting illustrated lecture by C. F. Goodrich, chief engineer of the American Bridge Co., Pittsburgh, fabricator of the huge \$77,000,000 structure, the largest of the kind in the world, requiring 200,000 tons of steel and 1,000,000 cu. yd. of concrete. The program was arranged by the District of Columbia section, American Society of Civil Engineers, with a number of other architectural and engineering societies of Washington participating.

Captivated by the engineering courage and ingenuity shown and the daring of agile workmen, tripping sure-footed on catwalks and scaling girders high above the bay, the audience saw the building of the great superstructure as Mr. Goodrich described the many difficult problems met and solved by engineers and erectors on the job.

One of the most dramatic features of the picture was the process of spinning 28-in. cables, explained by Mr. Goodrich and illustrated with slides, used to anchor the support in concrete blocks and laying of steel catwalks preparatory to actual construction. It was explained that there is enough wire in cables of the suspension bridge to reach three times around the earth—75,000 miles. It is a double-decked structure, providing a six-lane superhighway for automobiles on the upper roadway, and three

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In Ex-Cell-O Grinding Spindles end-play and radial-shake have been almost completely eliminated, with ample freedom provided to permit the high speeds necessary for fine finish and rapid cutting. This is made possible by the use of the famous Ex-Cell-O precision ball bearings, designed and produced for grinding spindle use exclusively. The results are products of extreme accuracy and higher finish at no greater cost!

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lanes for trucks and double-track rapid-transit railroad on the lower roadway.

The picture was prepared by the United States Steel Corp. The bridge was opened to traffic on Nov. 12, 1936. While it was estimated that 52,000,000 passengers will have crossed the bridge in 1937, indications are that this is a considerable underestimate.

Oliver Brothers Contest FTC Suit

WASHINGTON, May, 11.—Vigorous denials of a Federal Trade Commission complaint alleging violation of the brokerage clause of the Robinson-Patman Act are made in answers filed by Oliver Brothers, Inc., New York, which supplies market information and a purchasing service, and 11 buying and selling companies. The complaint charges that Oliver Brothers, while acting as agent of the buyers, whose purchases consist chiefly of hardware, accepted from the selling group brokerage fees or commissions without rendering service to the sellers. Both the buyers and sellers joined Oliver Brothers in declaring that the service given is of great value and that the compensation paid by sellers is no more than adequate. All of the respondents except two, the Keystone Emery Mills, Philadelphia, and Charles F. Baker & Co., Boston, are represented by Attorney Felix Levy of New York. While denying the allegations, the Keystone Emery Mills, saying it did not know the brokerage fees went to the buyers informed the FTC that it had written Oliver Brothers withdrawing the brokerage fee.

The Oliver Brothers' answer said that clients pay a specified sum of money for the service given and that it is available to all wholesale dealers, jobbers and merchants. It was declared that many of the small manufacturers would find it difficult, if not impossible, to dispose of their output to advantage except through Oliver Brothers. The reply said Oliver Brothers believe that substantially all of the buyers for whom they purchase do not sell to the great national chain stores or to persons operating large chains of retail stores, but that practically all of their merchandise is disposed of either to persons operating stores or to companies operating small chains of retail stores. Denial also was made that Oliver Brothers are under the direct or indirect control of the buyers, except that the latter instruct Oliver Brothers what

goods to purchase and what prices to pay. The buyers, it was pointed out, have no stock ownership in Oliver Brothers.

The section of the act under which the charge is brought is declared to be unconstitutional. Moreover, Mr. Levy says, it is unenforceable, vague, contradictory, confusing and "impossible for men of ordinary intelligence to understand." Which is taken to mean that the case may be carried to the Supreme Court for test, possibly the first test case of the Robinson-Patman Act.

Machinery Exports Show Large Gain

UNITED STATES exports of industrial machinery in March were valued at \$18,490,901, an increase of 30 per cent over the March, 1936, shipments which were valued at \$14,234,198, according to the Machinery Division, Department of Commerce. Compared with a year ago, foreign sales increased in seven of the eight machinery groups by from 8 to 76 per



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|---|-----------------------------|
| 1 Rough cam-turn. | 4 Chamfer all ring grooves. |
| 2 Rough face head, rough form ring grooves and ring groove lands. | 5 Finish cam-turn. |
| 3 Finish ring groove lands. | 6 Finish face head. |
| | 7 Finish grooves. |

JONES & LAMSON MACHINE

cent, while shipments in the textile, sewing and shoe machinery group declined by 8 per cent.

Owing to larger sales in most individual items, the exports during March of construction and conveying machinery amounting to \$1,365,809 were 76 per cent above the shipments during the same month last year valued at \$774,957. Foreign sales of excavators during the month reached \$264,668, a total more than double that of the corresponding shipments a year ago valued at \$127,908, and of hoists \$188,353, more than 6 times the

comparable figure for last year of \$30,232.

Export increases were registered during March in practically all classes of mining, well, and pumping machinery, the total of foreign sales in this group aggregating \$4,510,810, representing a 76 per cent gain over the \$2,565,859 worth shipped abroad in March, 1936. The most substantial gains were made in petroleum well and refinery equipment, exported to the value of \$2,799,402 during the month, more than double the corresponding sales a year ago valued at \$1,357,959.

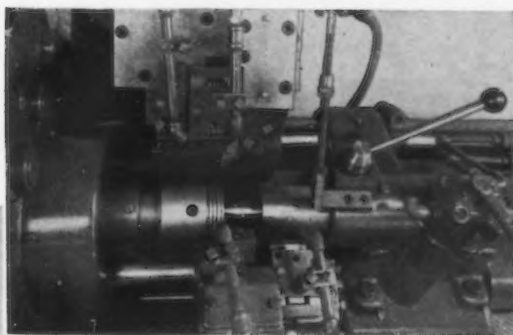
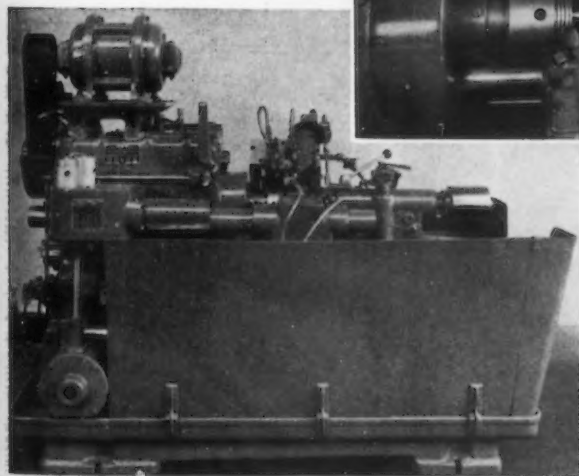
Despite the substantially increased sales abroad of most types of power-driven metal-working machinery during March, the total exports in this group were only 9 per cent greater than a year ago—\$4,497,750 against \$4,121,428—owing to considerable declines in a few individual classes, chiefly engine lathes, rolling mill machinery, and foundry and molding equipment. Among the individual classes in which shipments gained materially were lathes (other than engine), valued at \$492,154 against \$200,854 a year ago; vertical boring mills and chucking machines \$277,838 against \$109,724; milling machines \$604,058 against \$189,357; forging machinery \$326,612 against \$195,198; and grinding machines \$670,822 against \$451,336.

Overseas consignments of other metal-working machinery increased to \$479,913 during March, a 47 per cent gain over the March, 1936, shipments valued at \$326,672.

The exports of power-generating machinery, except electric and automotive, were valued at \$1,000,028 compared with \$922,506 in March of last year. Increased shipments were made of locomotives, steam specialties, and most items in this group, which more than offset the drop in the exports of steam boilers and Diesel engines.

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G. M. Plant at Linden, N. J., Operating

THE new Linden, N. J., plant of General Motors Corp., one of the largest automobile assembly plants in the world, has been completed and has been put into operation. The first car to roll off the new assembly line marked the official start of a production operation capable of supplying 120,000 Buicks, Oldsmobiles and Pontiacs a year.

The plant, occupying an 80-acre site on State Highway 25 and Edgar Road, was erected at a cost of \$5,575,000. When operating at full capacity it will provide employment for approximately 2000 persons.

The completion of the Linden Division provides General Motors with an ultra-modern plant in the heart of the industrial East, and marks another step in the decentralization of production of Buick, Oldsmobile and Pontiac automobiles by General Motors. A similar plant was established in Los Angeles, last year to serve the West Coast region. Prior to that time all three makes had been assembled only at the parent plants in Michigan.



..PERSONALS..

JOHN W. WHITE has been elected vice-president and general manager, Westinghouse Electric International Co., by the board of directors. He will make his headquarters in New York. Mr. White received his early education at Randolph-Macon and later while with Westinghouse at its main works at East Pittsburgh, attended night courses at the Carnegie Institute of Technology. Mr. White entered the employ of the Westinghouse Co. in 1905 and continued in the main works at East Pittsburgh until 1912. In 1917 he filled the position of manager of the central station and transportation division of the Detroit office. His first commission with export was in 1918, when he was assigned to Cuba as Westinghouse manager with headquarters at Havana. In 1925 he was appointed general manager of the Westinghouse Co. of Japan, later having been managing director

with a staff office at Tokio. In 1931 he was made managing director of the Compañía Westinghouse Electric Internacional, S. A., in Argentina, with headquarters at Buenos Aires, which position he held until last fall when he was promoted to general manager of the Westinghouse Electric International Co. and continued in that position until his recent election.

W. HERBERT BRETZLAFF, for the past four years vice-president in charge of national account sales for E. A. Laboratories, has been appointed vice-president of the Defiance Pressed Steel Co., Toledo, Ohio. He will handle sales engineering work on all regular products of the company and will co-ordinate the promotion of sales and engineering on the company's new line of hot water car heaters and defrosters.

E. M. LEVINE, who has been identified with the Cincinnati Milling Machine & Cincinnati Grinders, Inc., Cincinnati, for the past five years, has been made sales engineer in the company's Pittsburgh office, 1207 Empire Building. He is a

graduate in mechanical engineering of Washington State University.

B. F. HUFNAGEL has been elected chairman of the board of the Crucible Steel Co. of America, succeeding the late H. S. Wilkinson. Mr. Hufnagel retains his office of president.

WALTER E. CAMP has been appointed assistant to manager of

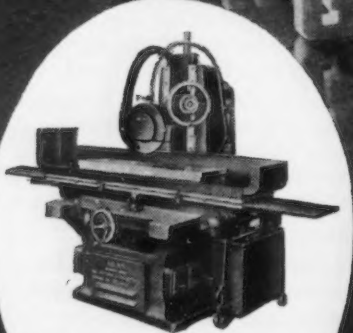


W. H. BRETZLAFF



E. M. LEVINE

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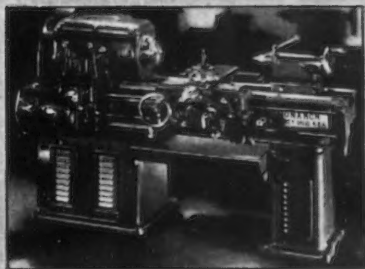
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public relations in the Pittsburgh district, Carnegie - Illinois Steel Corp. He is a graduate of Washington and Jefferson College and has been in the employ of the company since January, 1934. For two years Mr. Camp was employee news editor at the Clairton works. JOHN E. MCGRATH has been appointed successor to Mr. Camp at Clairton.

CHARLES I. WESLEY has been elected to succeed his father, the late Charles Wesley, Sr., as president of the Wesley Steel Treating Co., Milwaukee. He has been first vice-president since his father and he founded the company in 1914.



NOW, TURN ALL ANGLES...EVEN TO 90°. WITH THE MONARCH TAPER ATTACHMENT.



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Special Manufacturing Lathes . . . Monarch-
Keller Form Turning and Boring Lathes
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Lathe . . . High Speed Manufacturing
Lathes . . . Hydraulic Multi-Speed Lathe.

HERE is news of great significance . . . the first major improvement in Taper Attachments for Lathes in many years . . . the new Monarch Anti-Friction Bearing Taper Attachment. Briefly, its many advantages over ordinary taper attachments are:

1. Accurate smooth tapers are turned or bored under all conditions . . .
2. Far heavier cuts may be taken than are possible with the conventional taper gibbed friction type of taper attachment . . .
3. The tool is guided so smoothly and yet so rigidly that even the heaviest cuts are smooth and accurate at the most acute angles . . .
4. There is nothing to wear or get out of adjustment . . .
5. Much time can be saved on most taper turning; in addition, the quality and accuracy are greatly improved . . .
6. After turning or boring taper, the tool never touches the work on the return cut, when the feed is reversed . . .
7. Turns tapers up to 90° . . .
8. With slight modification, will turn and bore contour shapes from a master template.

THE MONARCH MACHINE TOOL COMPANY, Sidney, O., U.S.A.

MONARCH LATHES
COVER THE TURNING FIELD

New York Sales Office: 431 Graybar Bldg. • Chicago Sales Office: 622 W. Washington Blvd.

MODERNIZE WITH MONARCH

JOSEPH F. WESLEY, brother of the new president, has been elected first vice-president, and MELVIN H. KESTING, second vice-president. ARTHUR H. NUESSE continues as secretary, and JOSEPH F. HUSHEK, treasurer, with the added duties of works manager, formerly in charge of the late Mr. Wesley.

♦ ♦ ♦

G. R. HARRIS and M. H. BANTA have been transferred from the Jones & Laughlin Steel Corp. Aliquippa works metallurgical department, to the new research and development division at Pittsburgh. Mr. Harris, who will supervise patent work and technical publicity, was graduated in 1927 from Carnegie Institute of Technology in electrical engineering. He was employed in research work in the Bell

Telephone Laboratories in New York from 1927 to 1932 and has been with Jones & Laughlin since 1933. Mr. Banta was graduated in 1930 from Purdue University in chemical engineering and has been with Jones & Laughlin since that time. In his new position he will supervise experimental work on steel making.

♦ ♦ ♦

GEORGE CAMPBELL, secretary to G. C. KIMBALL, executive vice-president, Carnegie-Illinois Steel Corp., was retired May 1 after 39 years association with U. S. Steel. He began his work in 1898 as secretary to E. J. Buffington, who at that time was president of the former Illinois Steel Co. Later Mr. Campbell served as secretary to G. G. Thorp, Mr. Buffington's suc-

cessor, and he continued as secretary to Mr. Kimball when the latter succeeded Mr. Thorp.

♦ ♦ ♦

ROBERT B. MENEILLY has been appointed assistant to C. F. W. RYS, chief metallurgical engineer, Carnegie-Illinois Steel Corp. Mr. Meneilly attended Grove City College four years and received an M. S. in metallurgy at Carnegie Institute of Technology. He entered the employ of American Can Co., Chicago, in 1930 as supervisor of metals investigations, research department.

♦ ♦ ♦

WILLIAM O'NEILL SHERMAN has been appointed chief surgeon of the Carnegie-Illinois Steel Corp. J. HUBER WAGNER has been appointed chief surgeon, Pittsburgh district, and PHILIP H. KREUSCHER has been appointed chief surgeon, Chicago district. Dr. Wagner and Dr. Kreuscher formerly were associate surgeons.

Spring tempered COLLETS



Order From Stock

Scientifically heat treated to a true spring temper, "Rivett Mark" collets resist wear and hold their spring longer than collets of any other make. As standard equipment on all makes of lathes and millers, (see Rivett Bulletin 100B) they may be ordered for immediate delivery from the following stocks:—

CHICAGO
R. E. Ellis Engineering Co.
565 W. Washington Blvd.

DETROIT
Charles A. Strelinger Co.
149 E. Larned Street

BOSTON
Rivett Lathe & Grinder Inc.
18 Riverview Road, Brighton

RIVETT
LATHE & GRINDER INC.

BRIGHTON, BOSTON, MASS.



W T. HUGUS, superintendent of the American works of the Carnegie-Illinois Steel Corp., whose appointment was announced in these columns last week.

R. G. ADAIR, who has been assistant to the works manager of the Butler plant of the American Rolling Mill Co., has been appointed assistant director of industrial and public relations of the company, with headquarters in Middletown, Ohio. He joined the Armco organization in 1916 as a laborer. Because of his unusual interest and ability in safety work, he was later made supervisor of safety and in 1929 was placed in charge of training in all plants.

♦ ♦ ♦

CHARLES A. VAN BERGEN has become representative and application specialist for Textolite rollneck

bearings for the General Electric Co. He will make his headquarters at the company's West Lynn, Mass., plant.

♦ ♦ ♦

J. E. POWER, manager mechanical sales, New York district, for United States Rubber Products, Inc., has been appointed assistant sales manager of the mechanical goods division. He has been identified with the company since 1906. He is being succeeded in his former post by R. V. HILANDS, who has been manager of the Philadelphia and Baltimore districts. A. B. MEANS, of the Philadelphia sales organization, has been promoted to the managership of the mechanical sales branches in Philadelphia and Baltimore. R. F. JACKSON has been made assistant manager, mechanical sales, of the Baltimore branch. E. P. COLE has become manager of mechanical sales in the Denver branch.



THOMAS R. OWENS, new superintendent of sheet mills at the Gary works of the Carnegie-Illinois Steel Corp., whose appointment was announced in these columns recently.

FRED HURST, representative of the Roxalin Flexible Lacquer Co., Inc., Elizabeth, N. J., has been stationed in the Chicago area, with office at 5855 North Mobile Avenue, Chicago. Before going with the Roxalin company, he was for 16 years supervisor in the finishing departments of the Waterbury Mfg. Co. HOWARD VERRAULT has been made representative for the company in upstate New York, with headquarters in Rochester.

♦ ♦ ♦

HENRY H. SEABROOK, JR., has been made assistant to H. J. HEINEMAN, representative in the

(CONTINUED ON PAGE 113)

Sheet Metal Jobbers Discuss Problems of Distribution

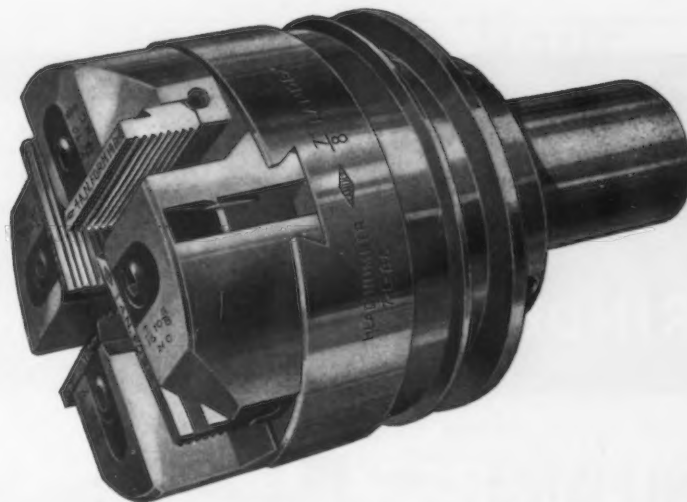
PROBLEMS relating to the distribution of sheet metal were discussed at the 26th annual meeting of the National Association of Sheet Metal Distributors at the Hotel Cleveland, Cleveland, May 5 and 6. This was the first annual meeting to be held in five years separate from the annual meeting of the National Wholesale Hardware Association with which the Sheet Metal Distributors Association is affiliated. There was a registration of over 50, including jobbers representatives of mills.

Brief opening remarks were

made by the president, A. W. Howe, J. M. & L. A. Osborn Co., Cleveland, after which George A. Fernley, Philadelphia, secretary-treasurer, reviewed the activities of the association during the past year. These included the credit bureau, social security bulletins, legal opinions and bulletins on Federal legislation. Referring briefly to the Robinson-Patman Act, he called attention to a provision of this act that permits the collection of triple damages for a company that has been discriminated against.

Preliminary overhead expenses

Raise YOUR standards of quality with LANDEX TYPE "L" HEAD



Accuracy and simplicity might well be used to describe the LANDEX Head, but that's not enough.

Faultless in design, hardened and ground throughout, accurate to the fraction of a thousandth in size adjustment,—the LANDEX will show definite improvement in thread quality and production.

The LANDIS tangential chaser is a big factor too in reducing tool cost to a mere fraction of former methods.

Write For Bulletin

LANDIS MACHINE COMPANY, Inc.

WAYNESBORO, PENNSYLVANIA

of members that have reported showed that the gross profits averaged 21.62 per cent and net average profits were 3.4 per cent of sales during the year. During the discussion later as to what extent overhead expense is being affected by the social security and other taxes, several members said that all taxes amounted to 1½ per cent or slightly more on gross sales. The increase in taxes this year due to the Social Security Act was estimated at not over ¼ of 1 per cent.

The chair raised a question as to whether manufacturers are stenciling prime galvanized sheets and reports from members indicated that most sheet mills are stenciling the top of each bundle, although some are doing it only on request.

Roofing Ternes in Demand

The tin and terne plate committee, of which O. F. Murphy, Lyon, Conklin & Co., Inc., Baltimore, is chairman, reported that the demand for roofing ternes is still being maintained and urged manufacturers to advertise their products. Hardware dealers are said to be selling this product at the old schedule and the committee thought that these should not buy roofing ternes at the same

price as distributors who buy in car lots and maintain regular schedules.

"Chiseling" is going on in making rolls of roofing ternes, some rolls having 28 and some only 26 sheets, the committee reported, and it recommended the adoption by the U. S. Bureau of Standards of a standard size of roofing terne roll, the roll to consist of 28 sheets 28 x 20 in. and the standard roll for valley roofing ternes to be 100 ft. and 50 ft. lengths. A resolution favoring the adoption of these proposed standards was approved.

Considerable discussion was aroused by the report of the galvanized and black sheet and corrugated roofing committee that was submitted by A. J. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind. One suggestion in this report was that distributors be allowed 10 per cent discount on the quantity, width and gage extras on flat sheets in addition to the regular \$2 a ton discount. As a representative of producers, L. D. Mercer, Republic Steel Corp., declared that such a discount would not be legal and it would be a waste of postage to ask mills to grant it.

An increase in the quantity extras

for galvanized flat sheets in less than car lots from 15c. and 25c. to 50c. per 100 lb. was another suggestion of the committee. Another was that the allowance of \$4 a ton to metal roofing distributors be changed to a sliding scale, depending on the size of the order. In view of the allowance of \$4 a ton to distributors of metal roofing, the committee recommended that the mills go over their lists and eliminate the names of those who are not legitimate distributors. R. H. Lyon, Lyon, Conklin & Co., Inc., Baltimore, vice-president, who was presiding at the time, said that there are 5000 so-called distributors of roofing sheets but that not all of them are legitimate distributors. Some of them, he said, carry the sheets as a side line and are not particularly interested in making a profit on them.

Quantity Differentials

Discussing mill extras, Mr. Lyon said that conditions in one part of the country differ from those in other parts and that he believed that the question of these extras would be solved only on a quantity differential basis. Distributors who make large purchases should have lower prices, he held. Mr. Fernley pointed out that under the Robinson-Patman Act an allowance may be made to distributors for performing definite functions in warehousing, selling, distribution and taking credit risks, but he warned that if quantity differentials are adopted the industry might be called on the carpet by the Federal Trade Commission.

The recommendation of the committee that mills revise and correct their lists of metal roofing distributors was adopted. No action was taken on the proposed adoption of sliding scale discounts for distributors for metal roofing, the committee being instructed to make another report at the next meeting.

A resolution was adopted protesting against the promotion by the Federal Government of consumer cooperatives, this being similar to a resolution adopted last year by the National Wholesale Hardware Association.

Robinson-Patman Act Explained

Provisions of the Robinson-Patman Act were explained in an address by Congressman Wright Patman, of Texas, one of the authors of the act, who also answered a series of questions giving his interpretations of some of the provisions, part of which probably will have to be cleared up by court decisions. Mr. Howe expressed the opinion that honest distributors will not be affected by this act.

"Possibilities in Sales Training"

MARSCHKE HEAVY DUTY GRINDERS AND BUFFERS

THIS MARSCHKE WIDE TYPE GRINDER is designed for maximum efficiency of relatively light grinding on long or bulky pieces of work. It is made in various sizes for wheels from 10" to 16" in diameter and with 1 to 5 H. P. motors.

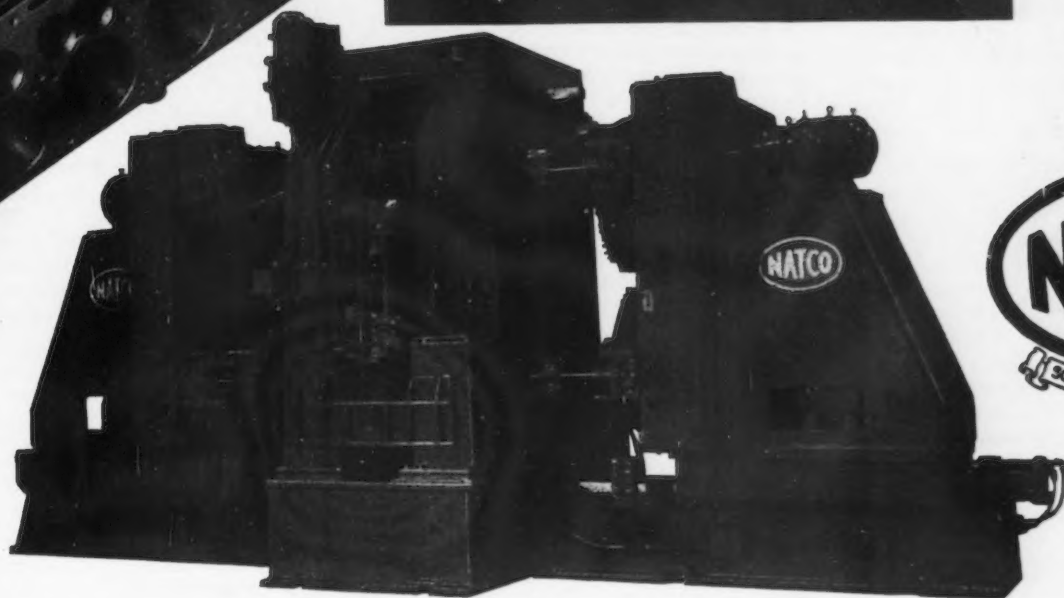
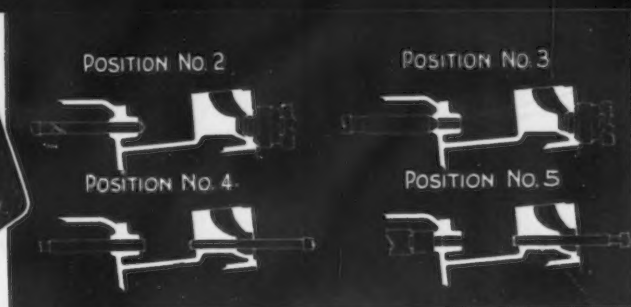
There is a place for a Wide Type Grinder in nearly every industry, but the Marschke line includes a dozen other types of Grinders, and whatever your grinding requirements, there is a Marschke for your particular kind of work.



A catalog showing seventy sizes of different types of MARSCHKE HEAVY DUTY GRINDERS and BUFFERS, will be sent promptly upon receipt of your request.

VONNEGUT MOULDER CORP.

1807 Madison Avenue, Indianapolis, Ind.



Machining Valve Guide and Tappet Holes 40 Cylinder Blocks Per Hour

● Here is a new method of machining valve guide and tappet holes. The large NATCO shown above is being used by a prominent automobile manufacturer for performing a total of 96 core drilling, form facing, drilling, chamfering, spot facing and rough reaming operations on the cylinder block also shown. With the exception of the finish reaming operation the 12 valve guide and tappet holes are completely machined on this NATCO.

● This machine is built of two large heavy duty NATCO hydraulic units and a large five position automatic mechanical indexing trunnion type fixture arranged to hold one cylinder block in each position. The operator starts the machine cycle and while the machine goes thru its automatic cycle, the operator unloads and reloads the fixture in the loading station.

● Perhaps the savings realized in using this new method are small . . . yet it's the little savings which build up your profits. Let NATCO engineers go over your drilling, boring and tapping problems. They will make a careful survey of your work . . . and suggest new methods which will effect those little economies which build up your profits.

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The National Automatic Tool Co.
Richmond, Indiana, U.S.A.

**Reduce
Production Costs!
Investigate
Today**

NATCO

Drilling, Boring and Tapping Machines

was the subject of a talk by F. H. Ramage, sales promotion manager Republic Steel Corp., Cleveland, who emphasized the importance of well trained salesmen. He outlined the sales school training methods of his company and told of the extreme care taken in the selection of young men for the sales course. There are too many average salesmen with no special ability, he said.

The distributor is becoming a more important factor and markets for products are rapidly changing. Better trained salesmen are required and distributors should take a more aggressive merchandising stand or manufacturers whose products they sell may look for more aggressive distributors. Few companies, in the speaker's opinion, have done a real job in sales training. This work is very expensive and may not bring immediate results, but the company must build up an organization for the future. The day of order takers is past, he said. Now the buyer demands steel to meet his needs and the salesman must know the products he is selling. Distributors, he declared, can increase their sales by having properly trained salesmen.

Trends in Steel Distribution

Significant trends in the distribution of steel was the subject of a talk by E. L. Shaner, president Penton Publishing Co., Cleveland, who showed by statistics a large increase during recent years in the use of flat rolled steel, pointing out that the demand for durable goods has declined and the large output of steel is going into consumer goods such as automobiles, refrigerators, stoves and other household products, this shift towards consumer goods causing a tremendous increase in the demand for sheets, strip steel and tin plate. In 1887 the American Iron and Steel Institute broke down finished steel products into four classes, only 11 per cent of which was in flat rolled products. In 1936 flat rolled products accounted for 50 per cent of the output.

Officers Reelected

The following officers were reelected: President, A. W. Howe, J. M. & L. A. Osborn Co., Cleveland; vice-president, Robert H. Lyon, Lyon-Conklin & Co., Inc., Baltimore; secretary-treasurer, George A. Fernley, Philadelphia. Members of the executive committee reelected were; Joseph Stelwagon, Stelwagon Mfg. Co., Philadelphia, and George O. M. Johnston, McClure-Johnston Co., Pittsburgh. In addition to the above, A. J. Becker, Ohio Valley Hardware & Roofing Co., Evansville, Ind., was elected a vice-president to fill a vacancy caused by death.

Warehouse Chapters Elect Officers

THE following chapters of the American Steel Warehouse Association have elected officers as follows for the coming year, W. S. Doxsey, executive secretary, 442 Terminal Tower, Cleveland, announces:

Missouri Valley chapter: President, Herman H. Kuehlke, Richards & Conover Hardware Co., Kansas City, Mo.; secretary, J. L. Snowden, Drake-Williams-Mount Co., Omaha, Neb.

Cincinnati chapter: President, Charles S. Dickerson, Miami-Dickerson Steel Co., Dayton; secretary, F. E. Morris, E. K. Morris & Co., Cincinnati.

Northwest chapter: President, L. B. Douglass, Scully Steel Products Co., St. Paul, Minn.; vice-president, Joseph Paper, Paper, Calmenson & Co., St. Paul; secretary, C. A. Thieme, Scully Steel Products Co., St. Paul.

Philadelphia chapter: President, A. C. Allshul, Joseph T. Ryerson & Son, Inc.; vice-presidents, L. Nor-

ris Hall, L. Norris Hall, Inc.; George P. Kraemer, Edgar T. Ward's Sons Co.; secretary-treasurer, J. J. Collins, L. Norris Hall, Inc.

Pittsburgh chapter: President, J. M. Hilbish, Jones & Laughlin Steel Corp.; secretary, T. A. Harper, Edgar T. Ward's Sons Co.; treasurer, William L. Abbott, McKee-Oliver, Inc.

Wisconsin chapter: President, George Gibbs, Gibbs Steel Co., Milwaukee; vice-presidents, L. R. Moise, Moise Steel Co., Milwaukee, R. E. St. John, Morley-Murphy Co., Green Bay; secretary-treasurer, George Smith, Joseph T. Ryerson & Son, Inc., Milwaukee.

Rubber Cable Prices Revised

THE General Electric Co., Schenectady, has revised its price book on rubber-power cable and has released the new data to its district sales offices as of May 8. The new prices represent a general readjustment in list prices and will be effective on May 24, 1937.



PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS
(Reported by Companies Which in 1936 Made 98.29 Per Cent of the Open-Hearth and 100 Per Cent of the Bessemer Ingot Production)

	Reported Production (Gross Tons)		Calculated Monthly Production All Companies		Number of Weeks	Per Cent of Capacity
	Open-Hearth	Bessemer	Monthly	Weekly		
1936						
January	2,794,766	196,389	3,039,804	686,186	4.43	52.39
February	2,707,320	202,445	2,956,891	714,225	4.14	54.53
March	3,094,939	185,040	3,333,853	752,563	4.43	57.46
1st Quarter	8,597,025	583,874	9,330,548	717,734	13.00	54.80
April	3,565,761	304,775	3,932,605	914,593	4.29	69.99
May	3,671,375	302,092	4,037,375	911,371	4.43	69.58
June	3,578,383	334,897	3,975,569	926,706	4.29	70.75
2nd Quarter	10,815,519	941,764	11,945,549	918,182	13.01	70.10
1st 6 Months	19,412,544	1,525,638	21,276,097	817,997	26.01	62.45
July	3,526,380	326,606	3,914,370	885,604	4.42	67.61
August	3,768,135	350,560	4,184,287	944,534	4.43	72.11
September	3,782,498	303,048	4,151,388	969,950	4.28	74.05
3rd Quarter	11,077,013	980,214	12,250,045	932,981	13.13	71.23
1st 9 Months	30,489,557	2,505,852	33,526,142	856,570	39.14	65.40
October	4,144,395	317,710	4,534,246	1,023,532	4.43	78.15
November	3,925,146	329,553	4,323,025	1,007,698	4.29	76.94
December	4,048,552	305,342	4,424,367	1,000,988	4.42	76.42
4th Quarter	12,118,093	952,605	13,281,638	1,010,779	13.14	77.17
Total Year	42,607,650	3,458,457	46,807,780	895,329	52.28	68.36
1937						
January	4,357,338	291,794	4,724,939	1,066,578	4.43	81.43
February	4,012,358	331,669	4,413,832	1,103,458	4.00	84.25
March	4,730,579	403,787	5,216,666	1,177,577	4.43	89.91
1st Quarter	13,100,275	1,027,250	14,355,437	1,116,286	12.86	85.23
April	4,601,620	390,198	5,071,875	1,182,255	4.29	90.27

1936 figures revised.

April Ingot Output Almost Reaches All-Time Peak of May 1929

PRODUCTION of steel ingots in April, as reported by the American Iron and Steel Institute, almost reached the record-breaking total of May, 1929. On a weekly basis, last month's output was just 11,029 tons per week short of the all-time peak. The April total was 5,071,875 gross tons against 5,286,246 tons, but the weekly average was 1,182,255 tons compared with 1,193,284 tons in May, 1929.

The April total was also exceeded by that of March, this year, when output reached 5,216,666 tons, but March had one more operating day; the weekly average in April was higher than in March—1,182,255 tons against 1,177,577 tons.

Total production in the first four months of this year amounted to more than 19,400,000 tons, almost 50 per cent more than the entire output in 1932, and also 50 per cent higher than the total for the first four months of 1936.

The industry operated at an average of 90.27 per cent in April against 89.91 per cent in March.

Steel Development Congress in France

THE Sixth International Congress for Steel Development which was scheduled to meet in New York this June, but cancelled, will be held in France this summer. A call for this meeting has been issued from the executive offices in The Hague, Holland, and delegates have been asked to meet in Duesseldorf, Germany, on June 21, for a preliminary conference. The delegates will then journey to Paris on June 22 and continue their conference there on June 23, 24 and 26.

Dr. John Johnston, New York, director of research of the United States Steel Corp., was host to members of the National Association of Directors of Research and their guests last week on a visit to the Homestead works of Carnegie-Illinois Steel Corp. The visitors inspected the new 100-in. plate mill and were in Pittsburgh to attend the formal opening of the Mellon Institute of Industrial Research.

with these New Machines

Social security and other taxes can make some companies anything but secure... high-cost plants may not survive. But in most industries today one or more concerns are getting set to meet practically any tax load the future may bring. They are increasing profit margin by reducing costs—with new equipment.

A survey of your turning work by Warner & Swasey Production Engineers may show you how you can accomplish that result. For example, a W & S survey in an eastern electrical plant showed how work done on a number of different machines could all be done better on one Warner & Swasey—and save \$2000 a year.

As long as there is a single low-cost plant in your industry, you cannot

meet the new high taxes, labor rates and material costs by raising prices. There is only one way to do it and live—get more for your production dollar by producing more per hour. The new Warner & Swasey Turret Lathes are so much faster, so much more powerful and precise, that you can't afford not to find out how they would reduce your costs and increase your profit margin.

**WARNER
&
SWASEY**
Turret Lathes
Cleveland

...OBITUARY...

JOHN H. GEWECKE, assistant treasurer of the United States Steel Corp., New York, died at his home in Rockville Center, L. I., on May 6, aged 53 years. He joined the com-

pany in 1901 a few months after its organization and was advanced from one position to another until 1919, when he became cashier. He was appointed to the post he held at the time of his death in April, 1922.

♦ ♦ ♦

CHARLES T. SCANNELL, manufacturing manager of the Buick Motor Car Co., Flint, Mich., died on May 2 in Passavant Hospital, Chicago. He started with the Buick company in 1906 as a machinist. Later he

was made plant superintendent and eventually general superintendent. He was advanced to the post of manufacturing manager directly under Harlow H. Curtice, president, three years ago. Before joining the Buick organization, he had worked in Little Falls, Schenectady and Utica, N. Y., and went to Flint with Weston Mott in 1906 before it became part of the Buick organization. Mr. Scannell was 54 years old.

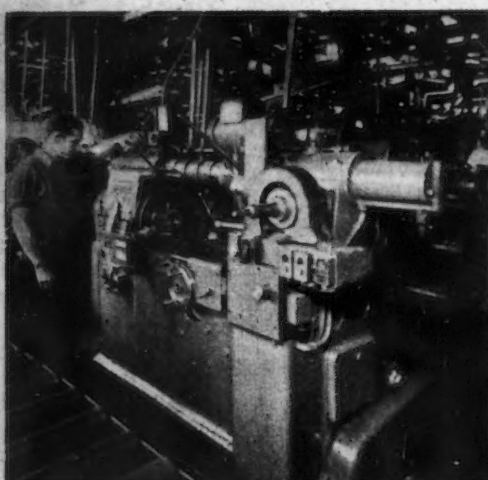
♦ ♦ ♦

ANDREW C. RAMSAY, mining engineer of Birmingham, died April 26 after a brief illness. He was a brother of Erskine Ramsay, chairman of the Alabama By-Products Corp., and had been engaged in engineering work in the Birmingham district since 1911.

♦ ♦ ♦

WILLIAM H. WHEELER, pioneer industrialist of Beloit, Wis., died

*Fully
hydraulic*



OPERATION & CONTROL

Illustration shows a Bryant No. 16 Internal Grinder grinding the bore of a drive gear.



The No. 16 Grinders have the distinctive features of Bryant suspended wheel slide. Fully hydraulic in operation and control, they enable the operator to work easily and rapidly to very close limits.

Bryant Grinders are made in three sizes for handling the middle range of work sizes, No. 16-16" swing, No. 16-28" swing, No. 16-38" swing. Also two spindles for hole and face grinding, No. 16-A.

Descriptive literature sent on request

BRYANT CHUCKING GRINDER COMPANY
SPRINGFIELD, VERMONT



JOHN H. GEWECKE

on May 5, aged 90 years. He was born in Wisconsin on Jan. 1, 1847, and after service in the Civil War settled at Beloit and founded the old Eclipse Windmill Co., the Eclipse Clutch Works and the Williams Engine & Clutch Works, all of which were purchased by Fairbanks, Morse & Co., as the nucleus of the present main works in Beloit.

♦ ♦ ♦

A. J. WILSON, metallurgist of the alloy steel division of the Republic Steel Corp., Massillon, Ohio, died recently following a heart attack.

Great Lakes Steel Orders Ore Bridge

DRAVO CORP., Pittsburgh, has been awarded a contract for an ore bridge of 10-ton capacity by the Great Lakes Steel Corp. The bridge, which will be able to operate over a length of 307 ft., will have a central span of 187 ft. It will be erected at Great Lakes Steel Corp. Hanna furnace plant dock at Zug Island, Detroit.

To provide for a future change of layout, the truss has been so designed that the shear leg at the furnace end can be moved 16 ft. which will make the ultimate span 203 ft.

Among the safety features are four automatic rail clamps with controls interlocked with the bridge travel motors. These rigidly clamp the bridge to its tracks when the structure is not being moved. In case wind blows against the bridge in excess of a predetermined velocity, an anemometer will cut off the power from the clamp operating switch and will prevent the operator from moving the bridge.

Motors will be supplied by the General Electric Co. and Westinghouse Electric & Mfg. Co. Controls and brakes will be supplied by the Cutler-Hammer Co. and Electric Controller & Mfg. Co.

Steel Makers Oppose Tax on Fuel Oil

PENNSYLVANIA steel manufacturers have appeared before the Ways and Means Committee of the lower house of the Pennsylvania State Legislature to protest against the enactment of the House bill No. 121 which would levy a tax of 2c. a gal. on fuel oil sold for domestic and industrial purposes in Pennsylvania.

Robert W. Wolcott, president of Lukens Steel Co., Coatesville, Pa., headed a committee of eastern Pennsylvania steel manufacturers who declared that this tax would add more than \$3 a ton to the steel-making costs of those companies that used oil almost exclusively for fuel.

The bill is said to have the backing of Pennsylvania coal miners

who are trying to force larger consumption of coal. Mr. Wolcott stated that it would cost his own company about \$1,000,000 to change over to gas producing equipment for the manufacture of coal gas with which to fire its open-hearth and heating furnaces.

Mr. Wolcott summed up his statement as follows:

"The Lukens Steel Co. has approximately 3000 employees. The city of Coatesville and the sur-

rounding country comprise a population of approximately 20,000 people who are, more or less, dependent upon this one industry. At our present rate of consumption of fuel oil this tax would impose a burden of between \$750,000 and \$1,000,000 a year. It is beyond the scope of human imagination to believe that the Lukens Steel Co. could withstand such an additional tax burden and we would simply be forced out of business, and the same is true of many other concerns."

"Gone with the Wind"



Type WH
5, 7½ &
10 H. P.

HAMMOND GRINDERS

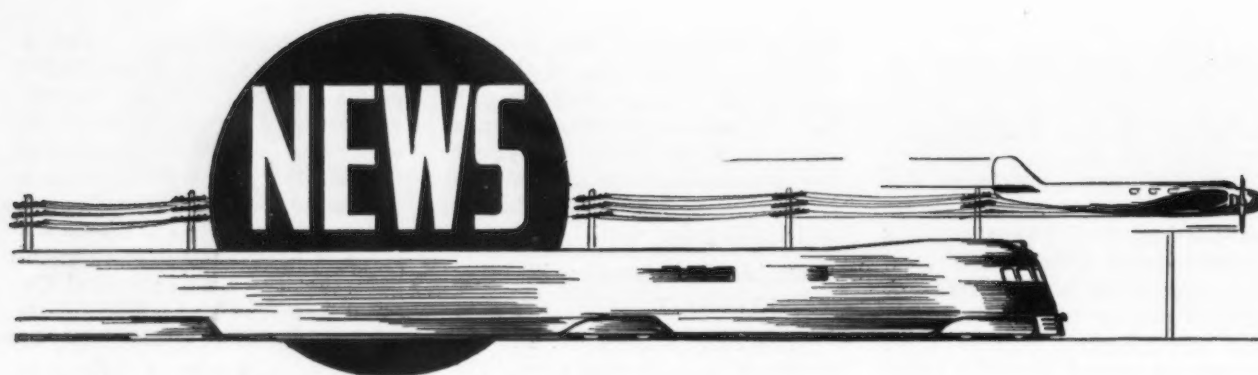
of KALAMAZOO with TOTALLY-ENCLOSED FAN-COOLED MOTORS

Set New Standards of Electric Grinder stamina and dependability by elimination of iron dust, metal chips, emery grit and shop dirt from motor windings. Write for bulletins showing complete line of grinders and polishers.

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Hammond Machinery Builders
INCORPORATED
KALAMAZOO, MICHIGAN, U.S.A.



Foundrymen's Forty-First Annual Convention Attracts A Record Attendance

WITH a total attendance of about 8000, the forty-first annual convention of the American Foundrymen's Association, held at Milwaukee, May 3-7, may be recorded as one of the largest in the association's history.

Outstanding also was the comprehensiveness of the technical program and the scope and attractiveness of the exposition of foundry equipment and materials. Some 28 foundries in the Milwaukee district, which is prominent for the number of its foundries and the diversity of cast products manufactured, were open for inspection. Luncheon round-table discussions and committee meetings were other activities, and entertainment features included the annual banquet and a stag dinner, the latter under the combined auspices of the A.F.A. and the Foundry Equipment Manufacturers' Association.

Election of officers for the ensuing year resulted in the naming



HYMAN BORNSTEIN, elected president of the American Foundrymen's Association for the coming year.

of Hyman Bornstein, director, testing and research laboratories, Deere & Co., Moline, Ill., president, and Marshall Post, vice-president, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., vice-president.

New members of the board of directors are: H. B. Hanley, in charge of foundry operations, American Laundry Machinery Co., Rochester, N. Y.; Duncan P. Forbes, president, Gunitite Foundries Corp., Rockford, Ill.; Thomas Kaveny, president, Herman Pneumatic Machine Co., Pittsburgh; C. J. P. Hoehn, president, Enterprise Foundry Co., San Francisco, and C. E. Sims, supervising metallurgist, Battelle Memorial Institute, Columbus, Ohio.

C. E. Hoyt is executive vice-president, D. M. Avey is secretary-treasurer and R. E. Kennedy is technical secretary of the association. E. O. Jones is director of the safety and hygiene section, J.

NEWS AND MARKET INDEX

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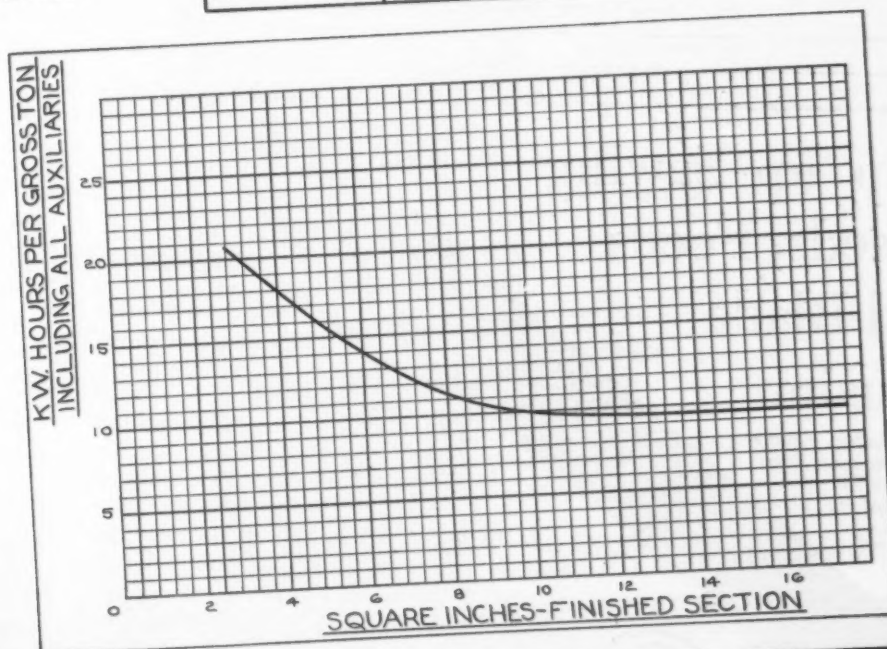
ENGINEERS REPORT

At Guest, Keen, Baldwin, Ltd., England --

From the day it started 17 Jan.-1936, this 19" billet and sheet bar mill has "made money." Equipped throughout with Morgoil Bearings, it has shown a most satisfactory power consumption. This is clearly indicated by the following data which is a matter of record.

These power consumption figures gain added importance when it is realized that the kilowatt hours per gross ton include not only the main mill motors but also all auxiliary drives, cranes, pumps, lighting, etc., for the period during which the figures were obtained.

SIZE	GROSS TONS	KW.HRS. PER TON	KW.HRS.AV.
2 x 2	23,348	426,890	18.25
2½x2½	9,024	139,670	15.45
2½x2½	6,296	89,020	14.15
3 x 3	1,126	11,610	10.36
3½x3½	4,837	50,920	10.51
3½"sq. & 4"sq.	9,890	97,130	9.83



R-21

MORGAN
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Continuous Rolling Mills
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Reininga is assistant secretary-treasurer and N. F. Hindle is assistant technical secretary.

Three Medals Awarded

A feature of the annual banquet, held at the Hotel Schroeder on the evening of May 6 and attended by more than 500 members and guests, was the presentation of medals for distinguished service in the advancement of the foundry industry. Dr. James T. MacKenzie, chief chemist and metallurgist, American

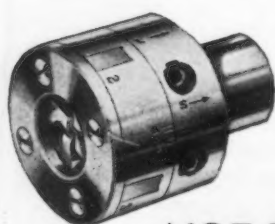
Cast Iron Pipe Co., Birmingham, received the J. H. Whiting Gold Medal in recognition of his research and practical work in the advancement of gray iron foundry practice, and John W. Bolton, metallurgist, Lunkeneimer Co., Cincinnati, received the John A. Penton Gold Medal for his work in metallurgy and practical application of research to the advancement of the foundry industry. The William H. McFadden Gold Medal was awarded to Charles W. Briggs, Naval

Research Laboratory, Anacostia Station, Washington, for his direction of important research and published writings on metallurgy of great value to steel castings producers.

The principal speaker at the banquet was Dr. James Shelby Thomas, president, Chrysler Institute of Engineering, Detroit, and of Clarkson College of Technology, Potsdam, N. Y., who spoke on "What the Machine Has Done to Mankind."

Foundry Activity at Peak

Comments by several authorities clearly indicated an unusually high



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MARSHALL POST, new vice-president of the American Foundrymen's Association.

general level of foundry activity and reflected also a definite optimism as to the immediate future. Considering the high rate of current operation, the large attendance at this convention would seem in itself to indicate the high status of the convention's proceedings and also perhaps a practical interest in the latest equipment and other developments demonstrated at the exposition.

The technical program comprised some 19 sessions at which more than 62 papers were presented. Five other sessions were devoted to the association's Shop Operation Course, an interesting feature for foundry superintendents, foremen and operating men, and there were round-table luncheon discussions under the auspices of the gray iron, malleable, steel and non-ferrous divisions of the association.

Of the formal technical sessions, four were devoted to gray cast iron, with 13 papers; two to malleable founding, with five papers; three to steel casting, with 10 papers; and two to non-ferrous,

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with eight papers. Other sessions covered refractories and sand research. Finally, six sessions, with 18 papers, were devoted to various topics related to foundry management. Of the latter group, discussions of apprenticeship training were especially appropriate at this time in view of the current shortage of skilled men in the foundry industry.

Papers and discussions at all of these sessions and also developments in equipment and materials to be seen at the Foundry Exposition reflected definite advancement

May 6. Foreman training was also discussed in a paper by A. D. Lynch, J. I. Case Co., Racine, Wis., at the same session.

Results of an A.F.A.-sponsored national competition for apprentices in gray iron, steel and non-ferrous molding and in pattern-making was an interesting part of the program arranged by the association's apprentice training committee. The castings and patterns of the winners of local competitions were on display at one of the A.F.A. booths, where the entries were judged by a committee that

selected first, second and third prize winners in each group. The 12 winners received both a cash award and an engraved certificate.

A method for determining proper wage rates by relative classification of job characteristics was discussed in a timely paper on "Job Evaluation" by Bertram Miller, supervisor, planning and wage department, General Electric Co., Erie Works, at another management session. Advantages to both employee and employer were outlined.

Another interesting contribution



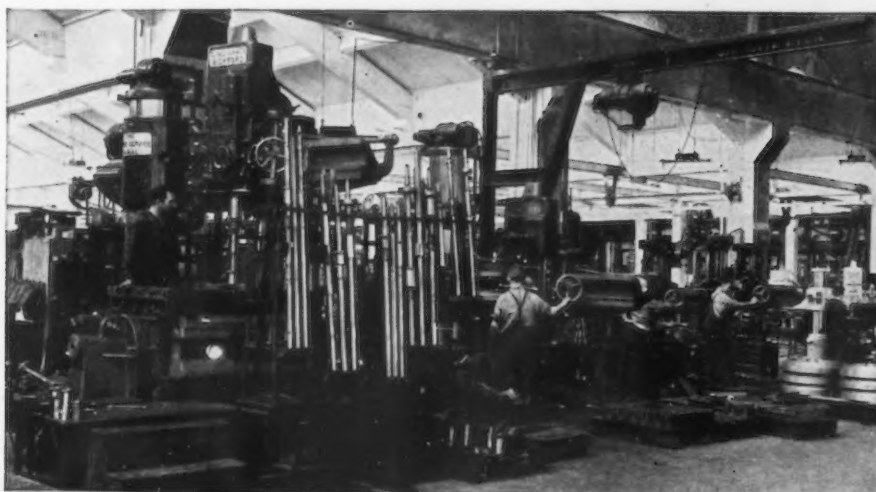
R. JAMES T. MACKENZIE, recipient of the J. H. Whiting Gold Medal of the A.F.A.

in foundry operation. All sessions were well attended.

Interest In Apprentice Training

Training of apprentices was emphasized by M. P. Miller, personnel director, Lynchburg Foundry Co., Lynchburg Va., as one of the most important considerations before the foundry industry, in an address at the management session held May 5. Formulation of a company policy and sympathetic understanding of that policy by the supervision were listed as essentials. Details of the shop and class work of the Lynchburg company's training plan are given in the paper.

Other papers at this session were: "Apprentice Training Plan of the Caterpillar Tractor Co.," by K. P. Crowell, Peoria, Ill.; and "Apprentice Training as Viewed by a Graduate Apprentice," by Carl F. Haertel, Falk Corp., Milwaukee. A conference on apprentice training, with H. A. Frommelt and Stewart Scrimshaw, Marquette University, Milwaukee, leading the discussion, was held during the afternoon of



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SUPER-SERVICE RADIALS



NEW members of the board of directors of the American Foundrymen's Association. From left to right they are: H. B. Hanley; Duncan P. Forbes, Thomas Kaveny, C. J. P. Hoehn, and C. E. Sims, below.

and one that further reflected the interest of the foundry industry in modern scientific methods was a comprehensive paper on "Time-Motion Study and Job Standardization," by H. C. Robson, superintendent, 39th Street plant, Link-Belt Co., Chicago. The paper

includes applications of standard methods in the Link-Belt foundry.

Foundry cost methods—malleable, steel, gray iron, and non-ferrous—were discussed at another management session, and occupational disease laws featured a meeting held May 6 under the



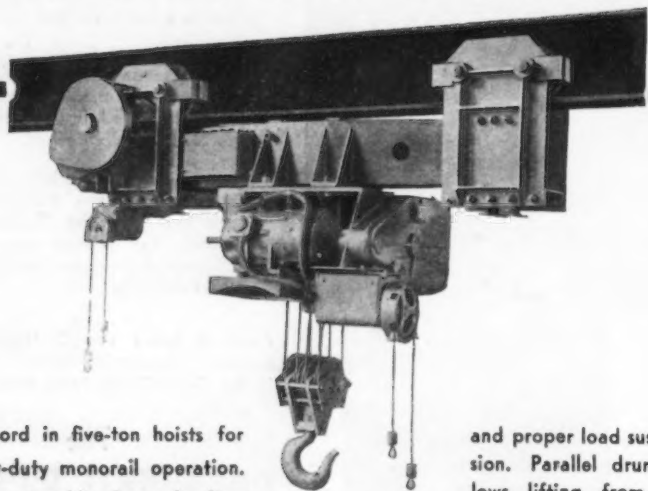
chairmanship of D. M. Avey, secretary of the association.

Four Sessions Devoted to Gray Cast Iron

With four formal sessions and 13 papers, the meetings devoted to gray cast iron were next in number to those covering management topics. Contributions included a paper on "Some Steel Works Castings" by J. Roxburgh, Davy Bros., Ltd., Sheffield, England, presented on behalf of the Institute of British Foundrymen. The paper explains problems encountered in the production of ingot molds, anvil blocks, cylinders and the like.

Procedure employed in the Allis-Chalmers Mfg. Co. foundry to produce high-test cast iron, defined as an iron having over 50,000 lb. per sq. in. tensile strength, was outlined by R. S. MacPherran, chemist of the company, in a paper on "High Strength Cupola Iron Practice." Effects of certain alloy additions were discussed. The cupola melting procedure described relates especially to carbon control, which

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was emphasized as most important. The paper includes a note relating to duplexing from the cupola into a crucible.

A paper on the "Effect of Coke Size on Cupola Melting" by J. A. Bowers, melting superintendent, and Dr. J. T. MacKenzie, chief chemist and metallurgist, American Cast Iron Pipe Co., Birmingham, was one of the outstanding contributions at another gray iron session. It gives details of a series of tests in a 21-in. diameter cupola, using four sizes of coke ranging from 1 to 4 in. Although the results are applicable only to 21-in. cupola operation, the trends are considered of interest because of possible application to general cupola melting. Conclusions reached include the fact that sulphur and carbon increase and silicon and manganese losses decrease with each increase in coke size. An outstanding conclusion, state the authors, is that after the first eight or ten ladles, the changes in the elements are practically unaffected by changes in coke size.

Typical analyses and mechanical test results of alloy cast irons suitable for nitrogen hardening are



JOHN W. BOLTON, recipient of the John A. Penton Gold Medal of the A.F.A.

summarized in a paper by J. E. Hurst, Lichfield, Staffs, England. Data are given for both sand cast and centrifugally cast material, and the hardening and stabilizing treatments are listed. Machine-

ability is emphasized as important. Details of the nitrogen hardening process are discussed, and procedure in the preparation of articles for treatment is outlined.

Further reference to other interesting papers at these sessions is planned for a forthcoming issue of THE IRON AGE.

Malleable Founding

A session on malleable founding included a paper on "Selection of Annealing Cycles and Furnaces for Annealing Malleable Iron," by A. F. Landa, engineer, Central Scientific Research Institute of Machine Building, Moscow, U.S.S.R. The various cycles are illustrated schematically, with each cycle divided into periods. Advantages and disadvantages of the various cycles are explained and factors to be considered when selecting a cycle are outlined.

Sand control as practiced in the plant of the National Malleable & Steel Castings Co. was outlined at the same session by E. C. Zirzow, chief chemist of the company, and an interesting outline of developments in melting malleable cast iron, since about 1912, was pre-

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sented by W. R. Bean, vice-president, foundry equipment division, Whiting Corp., Harvey, Ill.

Results of a study of the properties of malleable iron in the fully annealed and in two heat treated conditions (quench and draw) were presented in a paper by A. E. White and R. Schneidewind, director and research engineer, respectively, department of engineering research, University of Michigan, at a session devoted to malleable cast iron. The purpose of the investigation was to determine whether quick-anneal white irons for malleabilizing could be purchased successfully on the basis of chemical composition and to present rather complete physical property data for the designing engineer. "Newer Annealing Methods" was the topic of a luncheon and round-table discussion held by the malleable division, May 5.

Sessions On Steel Castings

The sessions on steel castings included an able address on "Designing for Steel Castings," by Major R. A. Bull, consulting engineer, Chicago, and an interesting report by the committee on methods for producing steel for cast-



CHARLES W. BRIGGS,
recipient of the William H. McFadden Gold Medal of the A.F.A.

ings, presented by F. A. Melmoth, Detroit Steel Castings Co. Committee reports covering the radiography and the heat treatment of steel castings featured a second session.

A paper giving data on the use of portland cement as a binder in foundry molding sand was an outstanding contribution to a session on steel founding held May 6. It was by C. A. Menzel, associate engineer, research laboratory, Portland Cement Association, Chicago. Laboratory studies of the relative influence of various factors affecting the strength and permeability of cement-foundry sand mixtures were outlined. The studies have established which factors are important in the foundry, and it was stated that the results indicate the general feasibility of using portland cement as a binder in molding sand. "Sand Control as Related to Steel Casting" was discussed at the same session by Charles Fuerst, Falk Corp., Milwaukee.

Non-Ferrous Foundry Practice

Two sessions with eight papers and a luncheon and round-table discussion were arranged by the non-ferrous division of the association. One session with three papers was devoted to sand control, while the second, and one of the final sessions of the convention, featured the following contributions: "Production of Pressure

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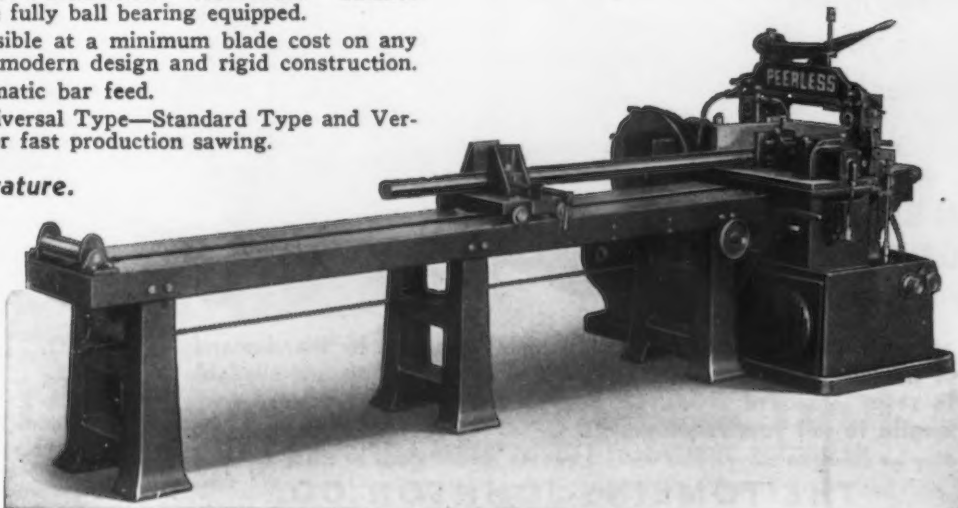
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Tight Castings in 30 Per Cent Cupro-Nickel," by T. E. Kihlgren, International Nickel Co., Bayonne, N. J.; "X-ray as an Aid in the Production of Aluminum Castings," by George Stoll and A. T. Ruppe, Bendix Corp., South Bend, Ind., and "Problems in Bronze," by Harold J. Roast, Canadian Bronze Co., Ltd., Montreal, Canada. The proceedings also included reports by the committee on analy-

sis of defects and the committee on recommended practices.

Active Interest in Foundry Show

The Foundry Show, held simultaneously with the 41st annual convention of the A.F.A., comprised displays by more than 210 exhibitors in floor space approximating 50,000 sq. ft. In attractiveness and in comprehensiveness of equipment and materials exhibited and

in practical interest, the latter reflected from reports by exhibitors, this year's show was quite up to previous exhibitions sponsored by the A.F.A. Exhibits ranged from the smallest of accessories to primary materials, safety devices, testing instruments, large melting, heat treating, sand preparation and materials handling, molding, and core making equipment, and dust control systems. Equipment was of current or entirely new design and much of it was demonstrated in actual operation. Wide aisles and other conveniences provided by the management made for the comfort of visitors and exhibitors alike. Orders for equipment were placed and a considerable amount of definite inquiry was reported. One evening of the week was open for visitation by the personnel of the some 85 foundries in the Milwaukee district and the attendance was very large. In addition, foundry students of trade and technical schools were given opportunity throughout the week to visit the exhibition and study the modern equipment and materials assembled at this foundry show.



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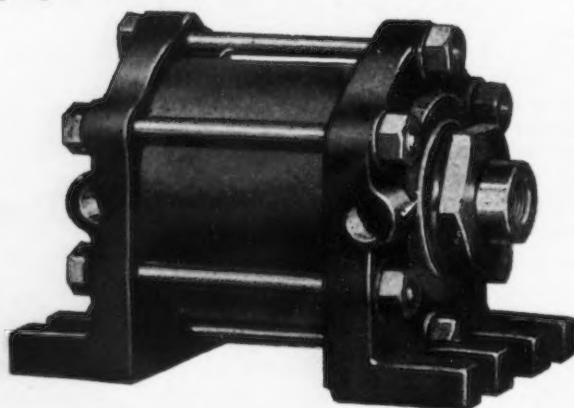
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Mexican Steel Industry Busy

DUE to a higher rate of building activity coupled with a public works program, the production activities of the Mexican iron and steel mills were considerably stepped up during 1936, with indications that the output for 1937 will register still further gain, according to Assistant American Trade Commissioner Miles Hammond, Mexico City, in a report to the Bureau of Foreign and Domestic Commerce.

Although Mexico has iron deposits sufficient to take care of its national demand for many centuries to come, it is stated, difficulty is said to be experienced in gathering sufficient scrap, hence scrap continues to be imported from the United States in important volume.

African Metals Corp., 25 Broadway, has been appointed exclusive sales representative for the steel products sold in the United States east of the Rocky Mountains, by the Societe Commerciale d'Ougree, which has the monopoly of sales for all the products manufactured by the Ougree-Marhaye steel works in Belgium, Luxembourg and France.

Tallest Pre-Fabricated Steel Smoke Stack

BUILDING an all-welded steel heating plant to heat its 1200-ft. factory at Peoria, Ill., R. G. Le Tourneau, Inc., manufacturers of heavy grading equipment, were confronted with the problem of constructing and erecting a smoke stack tall enough to carry the smoke clear.

Inside the plant, one quarter inch plate was pre-fabricated into an all-welded stack 104 ft. tall,



57 in. in diameter and weighing approximately 10 tons. This is thought to be the tallest pre-fabricated steel stack ever erected. The stack is anchored to the floor and roof of the boiler house, which reduces its outside height to 83 ft. A portable tractor-powered crane of all-welded design was built to lift and place this stack and for other heavy duty. This

crane rides on six 18 x 24 in. rubber tires. It is cable controlled from a power control unit mounted on the tractor.

As used to erect this stack, a feat which it performed in 30 minutes, the crane has an 84-ft. boom. However, it is reversible, the boom becoming a tongue and the 22-ft. tongue a boom, which gives it a 40-ton capacity for lift-

ing an all-welded steel house now nearing completion in the Le Tourneau factory.

C. O. Bartlett & Snow Co., Cleveland, has removed its New York office to Room 404-E, 30 Church Street, New York. It remains under the management of C. W. Ross, district manager, who has represented the company in that territory for more than 12 years.

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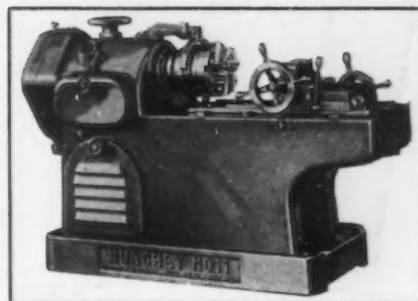
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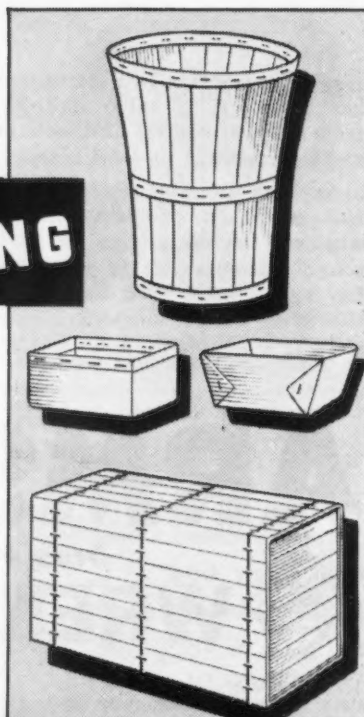
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Platinum, Palladium and Rhodium Electroplating Described

AT the recent First International Electrodeposition Conference, London, England, a very interesting paper on the electrodeposition of metals of the platinum group was presented by K. Schumpelt, of Baker & Co., Inc., Newark, N. J.

Mr. Schumpelt stated that in order to satisfy the growing demand for a better platinum plating solution an extensive research was started and, in 1927, Zschiegner applied for a patent covering the transformation of platonic chloride into an ammino-nitrite of the formula $Pt(NH_3)_2(NO_2)_2$. Corresponding compounds for palladium and rhodium were also included in this application. This type of salt subsequently has become known to the trade under the name "Platinum P Salt."

The main feature of Zschiegner's plating solution was the fact that the baths did not accumulate any salts or by-products. The two radicals, NH_3 and NO_2 , which were joined to the platinum in the ammino-nitrite, are eliminated in gaseous form from the baths through secondary reactions. A platinum bath, 3 gal. in size, has been in practical use for several years, and about 200 oz. of metallic platinum were plated out of it before it was discarded.

The platinum baths of the "P" salt type are operated at high temperature (180 to 210 deg. F), and ammonia has to be added from time to time in order to maintain the alkaline reaction of the baths. A mixture of ammonium nitrate and sodium nitrite is used as conducting salt. White and bright flash plates can be obtained at 4 to 5 volts in a few seconds; heavier deposits are built up at low current densities at about 2 to 3 volts. Scratch-brushing of the deposit at intervals is advisable in order to facilitate the final color buffing, according to Mr. Schumpelt.

Palladium, which is available in abundant quantity and at a much lower price than platinum, has, up to now, not found many applications in the plating industry; and yet, in Mr. Schumpelt's opinion, palladium could be very useful—if not as a finish, at least as a

protective coating. Due to its low specific gravity, palladium gives a deposit of almost twice the thickness of that of platinum, if compared weight for weight. For instance, to cover 1 sq. in. of surface with a deposit of 0.001 in. in thickness, 0.345 gram of platinum would be required, as against 0.195 gram of palladium. Based on the present prices for these two metals, the difference is still more striking: 1 sq. in. of surface covered with a deposit 0.001 in. in thickness would cost 65c. in platinum, but only 19c. in palladium.

Rhodium

During the time of the platinum-plating boom, another metal of this group, rhodium, made its appearance. Due to its high price, hesitatingly offered by the producers and cautiously accepted by a few manufacturers of high-price jewelry, it very soon conquered the whole field of jewelry and novelties, and is today a standard finish on almost all metal goods whenever a white, non-tarnishing finish is required.

Rhodium is one of the most inert metals of the platinum group. It is not attacked by aqua regia; neither do sulphur fumes affect it. Its hardness far surpasses that of platinum and palladium. Of the base metals generally used as coatings, only chromium is slightly harder. Above all, the beautiful white color and the high luster has opened a wide field of application for rhodium.

The first attempts in rhodium plating employed the commonly known rhodium salts, such as the chloride or the sulphate. Although deposits could be obtained from these solutions, they were far from satisfactory. A rhodium bath made according to the old Pilet formula, using rhodium chloride with a mixture of sodium and ammonium phosphates, yielded deposits of a steel-blue color and had an extremely poor throwing power.

A United States patent granted in 1934 to F. Zimmermann and H. E. Zschiegner covers very broadly the use of a complex rhodium phosphate in acid electrolytes, and practically all rhodium plating solutions sold in the United States and Canada come under this patent.

A typical plating solution for rhodium is made by dissolving 2

CAPACITY NOW DEPENDS UPON FLEXIBILITY TO MEET DEMAND

WHEN the Steel Industry was operated on the batch or intermittent production basis, it was a by-word that the industry was always having either a feast or a famine.

Today, the diversification of product and the increase in tonnage in fields once considered too specialized for primary producers, both made possible by the Continuous Flow Production methods, have resulted in a more even production throughout the Industry.

The last few years have proved the industry's adaptability and have emphasized the fact that capacity now means flexibility.

And flexibility means modern materials handling systems built around the principle of Continuous Flow.

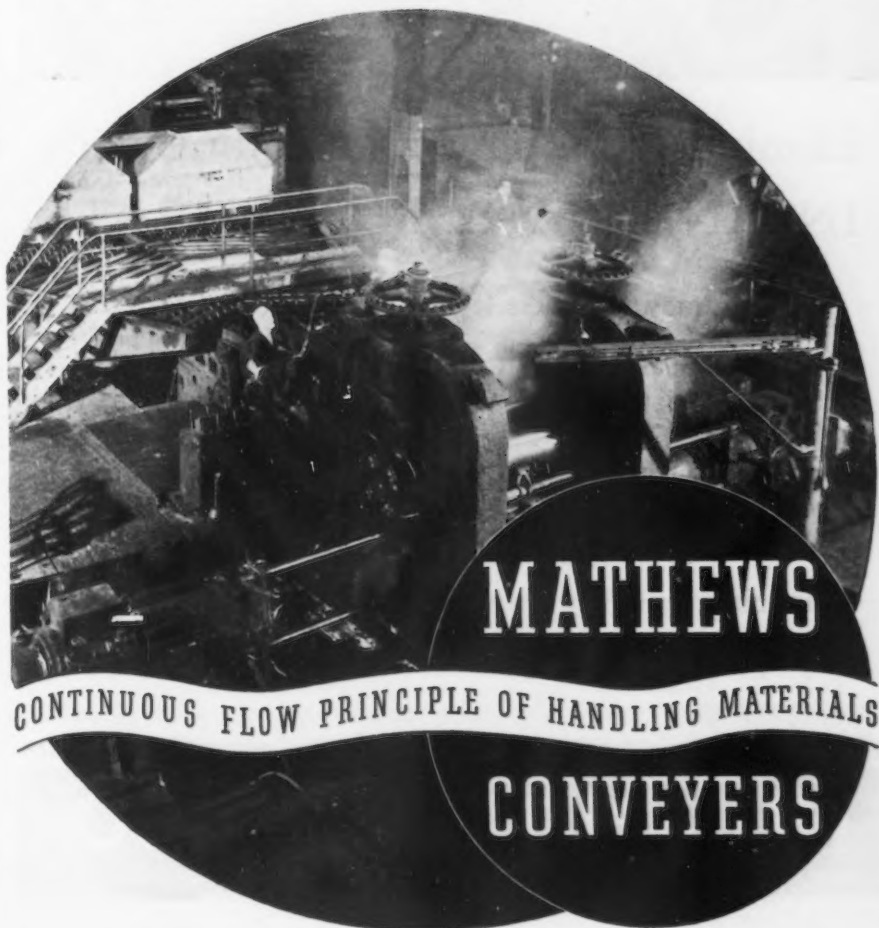
Practically, this in turn means Mathews Systems developed during the last decade of closest co-operation with—and in the heart of—the Steel Industry.

Processing Equipment installed during 1936-37, embracing the ultimate in design and engineering in the Steel Industry, is illustrated and described in our catalog on Steel Plant Conveyers. Available now.

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CONTINUOUS FLOW PRINCIPLE OF HANDLING MATERIALS

CONVEYERS

gram per liter of metal in the form of a complex phosphate in a 2 per cent sulphuric acid solution. Insoluble platinum anodes are used and, therefore, the rhodium has to be replenished by addition of a concentrated solution of the metal.

One great advantage of the modern rhodium plating bath is its flexibility. It can be operated successfully from room temperature up to 140 deg. F. and the current density can vary from 10 to about

100 amp. per sq. ft. The best solutions of this type produce in 30 min. plating time at 20 amp. per sq. ft. a bright deposit of approximately 0.00006 in., which does not require any buffing. The throwing power approaches that of a gold or silver plating solution. Small goods can be completely rhodium plated in a few seconds, even when suspended in bundles, and this is the reason why rhodium can compete successfully with chromium in

plating small articles, despite the tremendous price difference between the two metals.

Due to the high price of rhodium, the amount of deposit is in most cases very limited. It has, therefore, become a common practice to use a nickel underplate in order to increase the wearing quality. The amount of rhodium plated on different kinds of merchandise varies from a mere flash on the cheapest line of jewelry up to 9.7 mg. per sq. dm. (0.6 mg. per sq. inch), equivalent to a thickness of 0.000019 cm. (7.6×10^{-6} in.) on silverware. It has been found that a deposit of this thickness gives satisfactory wear over a period of years. The cost of such a deposit is approximately 5.20c. per sq. dm. of surface. To meet special requirements, the amount of deposit can be increased.



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CONVENTIONS

May 17 to 21—American Society of Mechanical Engineers, Statler Hotel, Detroit. Semi-annual meeting. Sabin Crocker, Detroit Edison Co., Detroit, general secretary.

May 24 and 25—American Gear Manufacturing Association, Galen Hall Hotel, Wernersville, Pa. Annual meeting. J. C. McQuiston, Penn Lincoln Hotel, Wilkensburg, Pa., secretary.

May 24 to 26—American Steel Warehouse Association, Inc., Greenbrier Hotel, White Sulphur Springs, W. Va. Annual convention. W. S. Doxsey, 442 Terminal Tower, Cleveland, secretary.

May 24 to 27—National Association of Purchasing Agents, William Penn Hotel, Pittsburgh. Annual convention. George A. Renard, 11 Park Place, New York, secretary.

May 27—American Iron and Steel Institute, Waldorf-Astoria Hotel, New York. W. S. Tower, Empire State Building, New York, executive secretary.

May 27 and 28—National Metal Trades Association, Palmer House, Chicago. Annual convention. Harry S. Flynn, Peoples Gas Building, Chicago, secretary.

June 14 and 15—Association of Machine Tool Dealers, Skytop, Pa. John Sauer, Jr., Peninsular Machinery Co., Detroit, secretary.

June 28 to July 2—American Society for Testing Materials, Waldorf-Astoria Hotel, New York. Annual meeting. R. E. Hess, 260 South Broad Street, Philadelphia, secretary.

Gives Course in Industrial Marketing

A TRAINING course in marketing industrial products is being pursued by a group of young technical graduates under the leadership of Bernard Lester, an industrial executive of the Westinghouse Electric and Mfg. Co. and lecturer at the University of Pittsburgh. The course is part of the University of Pittsburgh - Westinghouse Graduate Study program.

In the course, each student obtains his fundamental knowledge from a study of the instructor's recent book, "Marketing Industrial Equipment," keyed to assignments from current literature. To show the application of these principles, during the first half of the course each student makes a comprehensive survey of a particular industry representing a market for industrial equipment and supplies. During the last half of the course, each considers himself a sales manager of a company making a specific line of machinery equipment or supply product. He outlines a complete selling program, characterizing the product sold, sales advantages and a plan of distribution.

Shipbuilding Industry Greatly Improved

STATISTICS were released last week by the American Bureau of Shipping which reveal that the shipbuilding industry has improved considerably over the last 12 months, as compared to the previous similar period. 218 vessels having been built with a total of 310,051 gross tons, against 138 ships and 162,295 gross tons on May 1, 1936, a gain of 80 vessels and 147,756 tons.

The construction of tankers for oil companies is responsible for much of the increase, while several cargo vessels also contributed to the total, the remaining orders being for miscellaneous small craft.

The Sun Shipbuilding & Dry Dock Co., Chester, Pa., reports that 10 ocean-going tankers, aggregating 90,040 gross tons, are under construction, including two each for the Atlantic Refining Co., Standard Oil Co. of New Jersey, and Standard Oil Co. of California; three for the Texas Corp., and one for the Sun Oil Co.

At the Sparrows Point, Md., plant of the Bethlehem Shipbuilding Corp., ships totaling 52,100 gross tons are being constructed. Standard of New Jersey has four

tankers here, the Gulf Oil Corp., two, and the Texas Corp., one.

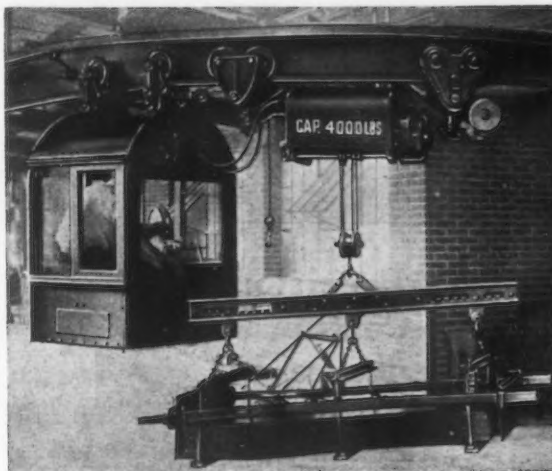
The Federal Shipbuilding & Dry Dock Co., Kearny, N. J., is building four Standard of New Jersey tankers also, totaling 30,400 tons, while a 5500-ton tanker for the Standard Oil Co. of Indiana is being constructed by the Manitowoc Shipbuilding Corp., Manitowoc, Wis.

At the Great Lakes Engineering

Works, River Rouge, Mich., four cargo vessels, two each for the Pittsburgh Steamship Co., and the Ford Motor Co., are under construction. The Pittsburgh Steamship Co. also has two 8500-ton boats in the yards at Lorain, Ohio.

Pusey & Jones Corp., Wilmington, is working on two 2550-ton cargo vessels for the Philadelphia & Norfolk Steamship Co.

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Zinc Prices Reflect London Bullishness

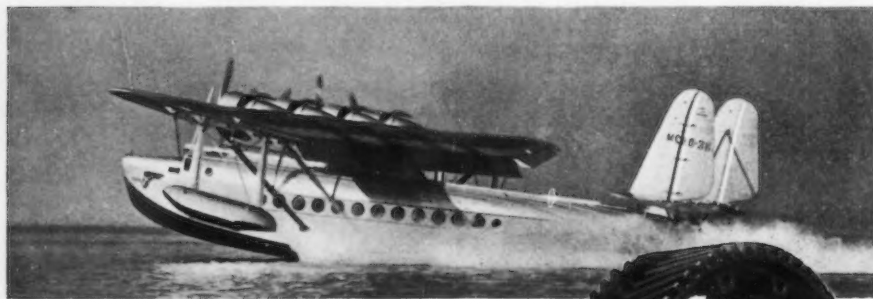
SPEAKING before the nineteenth annual meeting of the American Zinc Institute, Inc., St. Louis, April 26, W. R. Ingalls, of the American Bureau of Metal Statistics, pointed out that the time draws nearer every year when we shall be confronted with shortage in our domestic supply of zinc ore. Our old mines are becoming ex-

hausted, and there are but few that are being held in reserve.

The price rises in zinc have been startling. The St. Louis figure hovered around 4.90c. a lb. through 1936 up to November, after which it rose to 5.05c. and, finally, in March of this year a speculative fever in London raised the price there to £37, which was equivalent to 8.07c., St. Louis. However, the spelter statistics did not suggest a basis from which a runaway market might start. The inspiration

for that was probably the incidence of the speculative fury that had first affected copper, and then lead.

According to Mr. Ingalls, there has been in the London market a bullish speculation of unparalleled confidence, which has thrown consumers into a panic and caused them to contract ahead for their supplies as far as possible. Consequently statistics of transactions have been in the aggregate far in excess of actual deliveries. In the United States there have been the natural repercussions, and here transactions have not only been in excess of deliveries, but the latter have been in excess of actual consumption, reflecting transfer of stocks from producers' yards to yards of manufacturers, in other words a shifting of stocks from the visible position to the invisible.



Farrel - Sykes Precision Generated Gears Contribute to Reliable Performance of Aircraft Engines

In aircraft engines absolute reliability is vital to safety, and smooth, silent operation is essential to efficiency and durability.

Farrel-Sykes continuous tooth herringbone gears are used extensively in airplanes for reducing engine speed to the propeller. Over a period of ten years hundreds of sets have been put into use in transport, air mail, army and navy planes. They have been uniformly successful . . . not a single failure . . . not even a report of any trouble or any sign of wear.

Engineering resourcefulness, precision manufacture and the inherent superiority of Sykes gears are responsible for the successful solution of this drive problem, just as they have been for a wide variety of other applications in every branch of industry.



The design and manufacture of gears for aircraft engines are described in a paper, "Reduction Gearing for Airplanes," by W. E. Sykes. This paper contains technical data of interest and value to engineers and designers in the aviation industry and will be sent free to such engineers who request it on their company letterhead.

FARREL-BIRMINGHAM COMPANY, INC.
333 Vulcan St., Buffalo, N. Y.

FARREL-SYKES "The Gear With a Backbone"

G. E. Introduces New Double Recorder

A PHOTOELECTRIC instrument which will record simultaneously on one chart, two electrical quantities as low as one microampere, full scale, and representing a power consumption of but 0.000000001 watt from the measured circuit, has just been placed on the market by the General Electric Co. It is designated the double photoelectric recorder.

The double recorder can be applied for many other measurements. For instance, in temperature recording, it is possible to record outdoor and indoor temperatures for air-conditioning work, wet- and dry-bulb temperatures, refrigeration temperatures, and other temperatures in heat-flow problems.

In the field of electric gaging, it is of increasing importance to have simultaneous recording of pressure, as obtained by a strain gage on the mill housing, and thickness as obtained by the continuous strip gage. At a glance it is possible to see variations in thickness with changes in pressure on the mill rolls. With two continuous strip gages, one on each side of the material, a measurement of uniformity in thickness of the strip is obtained and therefore a measure of quality. Electric-gage recordings can be so related that a continuous check on operating conditions, such as poor bearings and rolls, is at hand. Other applications are the recording of high-resistance voltmeter-ammeter measurements, illumination measurements, and others requiring galvanometers or other types of measuring elements.

Strike Threat Against J. & L. May Come to an Issue This Week

PITTSBURGH, May 11.—At least one large independent steel company's attitude towards a signed contract with the SWOC is expected to be disclosed this week when H. E. Lewis, chairman, Jones & Laughlin Steel Corp. meets with SWOC officials on Wednesday to give his company's answer to the request for written agreement. Meanwhile, union members of two lodges at the Jones & Laughlin plants have authorized the SWOC to call a strike by midnight, May 12, unless a contract is signed by the company. Opposition to a strike has been sounded at the company's Aliquippa works by W. H. Turner, head of a newly organized United Iron and Steel Workers of Aliquippa, a local group independent either of the SWOC or the A. F. of L.

So far Jones & Laughlin Steel Corp. has not indicated that it would or would not sign a contract, whereas Republic Steel Corp. and Youngstown Sheet & Tube Co., while agreeing to bargain with the SWOC, have flatly refused to enter into a written agreement. Strike threats have been made against these companies by union members. Most observers place great importance upon the outcome of the Jones & Laughlin Steel-SWOC meeting this week, as indicating the future trend of independent steel companies' relations with labor organizations.

Metal Finishing Exhibit in June

A ONE week's special exhibit of metal finishing equipment and metal finishing processes will be held June 12-19 at the exhibit rooms of the Metals and Plastics Bureau in Rockefeller Center, New York. This exhibit will be known as the Silver Jubilee Metal Finishing Exhibit because of the silver anniversary convention of the American Electro-plating Society held concurrently in New York.

The displays will include many of the year's developments, one of the most interesting of which is the evaporated film process of plating shown by the Evaporated Metal Film Co., Ithaca, N. Y. By this method metal is disbursed through vacuum from source to surface to be plated. Other displays will show cleaning and plat-

ing equipment in action and recent applications of synthetic enamels and other coatings.

Technical motion pictures in the realm of metal finishing will form part of the exhibit program and Wednesday evening, June 16, has been set aside both by the exhibit committee and by the A.E.S. con-

vention management as a metal finishing motion picture evening. Among the films to be shown is one produced by the Bell Telephone Laboratories, which demonstrates the many interesting methods developed at the laboratories for testing different finishes.

Inland Steel Co. is offering stockholders additional shares of common stock on the basis of one share for each 20 shares held, at \$90 a share. This offer is being made to stockholders of record May 14 and will remain open until 3 p. m. Eastern daylight saving time.

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Speakers Selected For Jobbers' Meeting

AMONG the speakers on the program of the 28th annual convention of the American Steel Warehouse Association, Inc., May 24-26, White Sulphur Springs, W. Va., are: Dr. James S. Thomas, president, Clarkson College of Technology and Chrysler Engineering Institute; Whiting Williams, industrial consultant, author and lecturer; G. Wright Hoffman, pro-

fessor of markets and prices, Wharton School of Finance and Commerce, University of Pennsylvania.

A major part of the program will be devoted to practical problems relating to the operation of steel warehouses. A plan for analyzing warehouse costs will be presented. Another program feature will be a summarized statement of the principles of secondary steel distribution. Chairmen of the association's several commodity committees will discuss con-

ditions surrounding the marketing of products in which they are interested.

W. S. Doxsey, 442 Terminal Tower, Cleveland, is executive secretary.

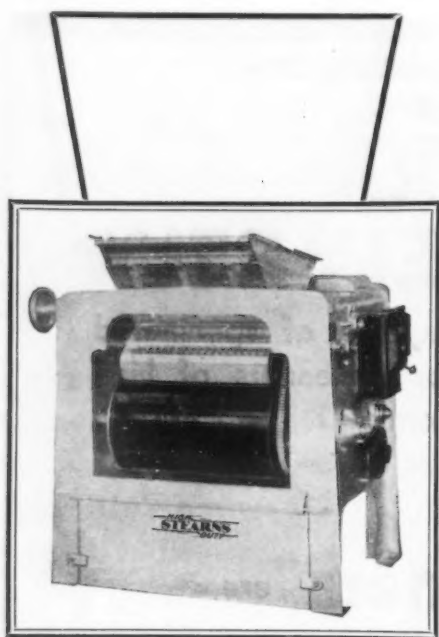
Steel & Wire to Use More Coke Ovens

AMERICAN STEEL & WIRE CO., will place in operation May 15 the fourth battery of ovens at its Cleveland coke plant. This will be the first time in four years that all the ovens at this plant have been operating. The plant is being completely rehabilitated by the expenditure of more than \$500,000. It will have a daily output of 2700 tons of blast furnace coke, part of which will be used in the American Steel & Wire Co.'s Central furnaces in Cleveland and the rest in the Carnegie-Illinois furnaces at the Ohio works in Youngstown.

Firth-Sterling To Build in Detroit

THE Firth-Sterling Steel Co. of Detroit is building large modern offices, warehouse and carbide sintering plant at Chicago and Oakman Boulevards. The new facilities will double present capacity for high-speed steel, tool and die steels, stainless steels and sintered carbide cutting tools and blanks, as well as dies for wire and tool drawing. The Austin Co. will build the new plant. Extensive building operations are also going on at the main plant at McKeesport, Pa.

Follansbee Brothers Co. reports sales, exclusive of the Sheet Metal Specialty Co., for April, 1937, 71.1 per cent in excess of the corresponding month of 1936. Sales for the first four months of 1937 were 66.6 per cent in excess of the first four months of 1936. April sales of the Sheet Metal Specialty Co. were 102.1 per cent in excess of April last year, and in the first four months of 1937 sales increased 58 per cent over the same period last year.



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Governmental Regulation of Trade Unions Not Usually Effective Says Conference Board

EXPERIENCE in the United States and in other countries has demonstrated that no complete nor final solution of the strike problem can be expected from legislation designed to eliminate strikes by means of compulsory arbitration, limitation of the right to strike, the imposition of fines on employers and employees, and other related measures, according to the National Industrial Conference Board.

In a new study, "Governmental Regulation of Labor Unions," the Conference Board examines and reports on the results obtained in those sections of the United States and in other countries where legislation to regulate labor unions' activities and diminish the number of strikes has been enacted. Included in the study are analyses of the provisions of, and the degree of success achieved by the Colorado Compulsory Investigation Law, the Kansas Court of Industrial Relations, the British Trade Disputes and Trade Unions Act, the Canadian Industrial Disputes Investigation Act, and various acts in force in Australia and New Zealand.

The study shows that Colorado's effort to curb strikes has been one of the most successful. The legislation in that State, enacted in 1915, gave jurisdiction over disputes between employers and employees to the Colorado Industrial Commission, stipulated that 30 days' notice must be given of changes in wages, hours, and conditions of employment, and that no change should be put into effect until final determination by the commission. Strikes and lockouts prior to, or during, a hearing were declared unlawful, except in an industry "not affected with a public interest."

Between 1915 and 1924 a total of 1157 controversies were brought to the attention of the commission, of which 1084 were settled without a strike or lockout. During the past decade, strikes in Colorado, with the exception of 1934, have been infrequent, averaging only nine a year. The Conference Board's study points out that the Colorado legislation has tended to minimize stoppage in smaller disputes, to make open industrial warfare less probable, and to encourage voluntary settlements. The commission, how-

ever, has developed no uniform principle of wage determination and has frequently failed in large disputes.

The effort made in Kansas to

control industrial disputes has been less successful. Legislation was enacted in 1920 providing for State intervention in the event of labor disputes in certain industries, imposing fines for strikes and lockouts, and creating the Kansas Court of Industrial Relations to settle all controversies.

Shortly after the Kansas Court of Industrial Relations began to operate, its authority was challenged and the protest was upheld by the United States Supreme



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PACIFIC COAST REPRESENTATIVE
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Court. Since this decision, the Kansas Court has continued to function, but only as an administrative agency and not as a medium for the compulsory settlement of industrial disputes.

The British legislation, although exceptionally comprehensive, has also failed to solve the problem of curbing industrial disputes. The Conference Board's study, after outlining its principal provisions, concludes that "There is no evidence in the data relating to strikes compiled by the British

Ministry of Labor that the British Trade Disputes and Trade Unions Act of 1927 has contributed to a reduction in strikes.

"From 1928 to 1935 the number of strikes was less than in the period from 1919 to 1925, but this reduction was probably attributable in part to differences in business conditions and the employment situation in the two periods. In 1936 there were 808 strikes, or more than in any other year since 1920. The act has also apparently failed

to eliminate 'jurisdictional and sympathetic strikes.'"

Experience in the other countries covered by the Conference Board's study also tends to show that, in general, the mere enactment of legislation has done little to diminish the number of strikes. Prohibition of strikes and lockouts during a limited period to permit investigation of the issues involved, as in Colorado and also in Canada, appears, according to the board's study, to have been "reasonably successful." Where strikes and lockouts have been forbidden entirely or permitted only under specific conditions, however, various other problems have arisen.

"The denial or rigid limitation of the right to strike," the Conference Board's study points out, "implies the substitution of some other means of enabling workers to obtain better wages and more satisfactory conditions of employment. Under the policy of arbitration usually employed it is possible to reach an equitable adjustment of wages, but other issues, such as the question of the closed shop, must be more or less arbitrarily decided.

"Compulsory arbitration by governmental agency, moreover, tends to introduce political issues in regard to policies. The ultimate result is frequently the development of a political labor party and elimination of former party alignments, followed by enactment of legislation fixing wages or wage standards, as illustrated by New Zealand. Under compulsory arbitration systems, it is also customary to apply an award to an entire industry, with the effect of standardizing conditions without regard to the financial condition of individual enterprises."

Furthermore, the report states, the prohibition of strikes under systems of compulsory arbitration is not always effective. Except in the case of complete suppression as in Germany or Italy, workers are at liberty to quit work individually. Unless collective action is authorized by union officials, it is not always easy to differentiate between a general exercise of the right to quit and a strike. It has also been demonstrated that the penalties against strikes are seldom applied if the party in power depends upon labor organizations for support.

To Survey Minerals Needed For Defense

WASHINGTON, May 11. — Senator Reynolds of North Carolina and Representative Scrugham of Nevada have introduced identical joint resolutions to set up

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PANGBORN CORPORATION . . . HAGERSTOWN, MARYLAND

a five-man technical commission to make studies and investigations for the purpose of determining to what extent minerals essential to the national defense or industrial needs are not readily available domestically in sufficient quantities to meet such needs.

The commission would serve for four years and it would make an annual report to Congress, with recommendations for appropriate legislation with respect to minerals essential to the national defense and industrial needs. It would be appointed by the President and consist of three employees of the Bureau of Mines, a geophysicist in the Geological Survey and a mineralogist-chemist in the National Museum. The three Bureau of Mines members would consist of a geologist, a mining engineer and a metallurgist.

The survey would cover the continental United States, including Alaska; Hawaii, Puerto Rico and the Virgin Islands. Power would be given the commission to subpoena witnesses and records in connection with hearings.

Japan Leading Cuban Scrap Purchaser

A SHARP advance in Cuban exports of iron and steel scrap set in during 1936, according to information received in the Bureau of Foreign and Domestic Commerce from Assistant Commercial Attaché Charles H. Ducote, Habana. Comparative figures of iron and steel scrap exports from Cuba during 1935 and 1936 show that Japan moved up from an insignificant purchaser of Cuban scrap iron in 1935 to the leading one last year. In 1935, Japan took only 11,280 kg. of Cuban scrap iron out of aggregate Cuban foreign sales totaling 1,544,464 kg. Last year Japanese purchases of Cuban scrap increased to 23,492,000 kg. against 15,340,928 kg. purchased by all other foreign outlets. The United States took 1,657,429 kg.; the United Kingdom, slightly over 6,000,000 kg.; and Poland and Yugoslavia, just over 3,000,000 kg. each, according to the report.

Materials Circular Reissued by Bureau

ARCHITECTS, engineers, designers of special machinery, and other persons interested in the strength and other properties of engineering materials, and especially in unusual uses for metals and

alloys, have been informed by the Department of Commerce that an important publication of the National Bureau of Standards in this field that has been out of print for several years is again available. In reprinting Circular C101, "Physical Properties of Materials: Strengths and Related Properties of Metals and Certain Other Engineering Materials," the Bureau decided to reissue the publication without changes, but to provide a supplement carrying important corrections which have come to the Bureau's attention in the 13 years that

have elapsed since the last printing of the circular.

The price of the new printing of C101, complete with supplement, is 40c.; supplement alone, 5c. a copy. Orders should be sent to the Superintendent of Documents, Government Printing Office, Washington, D. C.

American Steel Foundries reports first quarter earnings at \$1,057,752, equivalent to 99c. a share. This compares with \$461,220, or 37c. a share in the first quarter of 1936.

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- ★Accurate Stepless Speed Control . . . Minimum to Maximum in either direction

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VARIABLE SPEED TRANSMISSIONS

THE IRON AGE, May 13, 1937—107

Roosevelt Expected to Give Views On Revised NRA Rules for Industry

WASHINGTON, May 11.—While it is still assumed that the administration will ask for Federal legislation at the present session of Congress to control wages, hours, working conditions and trade practices, the re-

turn to Washington of President Roosevelt is awaited to learn what his specific program will be, provided it has been determined upon. It is generally thought that he will make known his plan soon upon returning to the Capital, possibly

after conferring with Congressional leaders.

Meantime, contemplated legislation on the subject has so far been confined to the recently passed Guffey coal act and the pending Ellenbogen bill, which proposes to set up an NRA for the textile industry.

Hearings on the 57-page Ellenbogen bill were begun yesterday before a sub-committee of the House Committee on Labor.

Representative Keller, of Illinois, who heads the sub-committee, considers the proposed textile bill as a possible model for the steel, automobile and mining industries. He told THE IRON AGE that he did not think there is any likelihood of separate NRA legislation at the present session for these industries. It is his view that there may be some general labor legislation, however, before adjournment. This is the prevailing opinion, but it is the belief that the character and extent of the legislation will be decided by the President and not by Congress itself. It is also doubted that it will set up a long list of NRAs, if any at all are established. Conflicts and overlapping of provisions, it is contended, make such a plan impracticable and cumbersome, extremely difficult to administer. On this basis, it is the thought that the administration plan, if offered, will include the steel, automobile and other industries under a single basic law, possibly excepting the textile industry and raw resources industries.

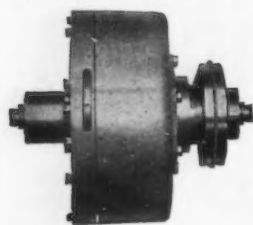
The textile bill, giving extremely wide control over the industry by the National Textile Commission, has been redrafted and differs so greatly from its original form that Representative Ellenbogen has termed it a "monstrosity." He said he will ask that its unfair trade practice be eliminated because of indifference or opposition to it by trade manufacturers. It is his purpose, he said, to ask that it cover only wage, hour and working conditions. Members of the textile union have objected to the bill because it proposes a \$15 week minimum wage and a 40-hr. work week instead of former provisions for an \$18 minimum weekly wage and a 35-hr. work week. Representative Keller, however, has said that the hearings are designed to permit free expression of opinion by both management and labor for the purpose of making any revisions that may be considered desirable.

The bill has been redrafted, it was stated at the open hearing, to meet all constitutional requirements. It will be submitted to the

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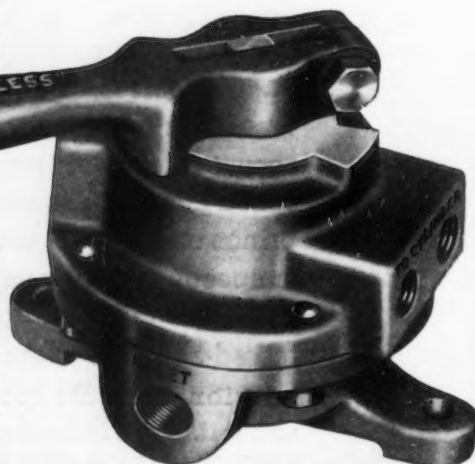
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Department of Justice and the Department of Labor before the final draft is prepared. Dissension in the sub-committee, arises from Republican members as well as from objections of Mr. Ellenbogen, whose original bill is said to have had White House approval. The White House has as yet had no opportunity to study the redrafted bill and therefore its attitude toward the measure is not known.

Patman May Abandon Reciprocal Sales Bill

WASHINGTON, May 11.—A languid audience of about one dozen heard Representative Patman of Texas explain his Reciprocal Sales bill before a sub-committee of the House Committee on Judiciary yesterday. He was followed by brief remarks of George J. Burger, secretary, National Association of Independent Tire Dealers, in approving the measure. Then the hearing adjourned until next Monday, when opponents are invited to appear before the committee. Interest in the bill is so slight that it is believed its author will abandon it, at least for the present session.

Mr. Patman on introducing the bill, which would bar reciprocal trading, said it was aimed chiefly at the steel and aluminum industries, but at the hearing yesterday he said reciprocal trading has become a growing abuse since passage of the Robinson-Patman Act. The implication therefore was that Mr. Patman now considers the measure as a supplement to the Robinson-Patman law as a further aid to small and independent stores and against chain stores.

Mr. Patman said that reciprocal trading will cause small business enterprises to suffer. His bill, he said, would permit the Federal Trade Commission to do for industry what the Interstate Commerce Commission does for the railroads.

The bill not only bars reciprocal sales, but also prohibits reciprocal services. Mr. Patman indicated that the provision against reciprocal services will be stricken out because of a report from Chief Counsel W. T. Kelley, of the Federal Trade Commission, which expressed doubt that Congress can legislate as to services.

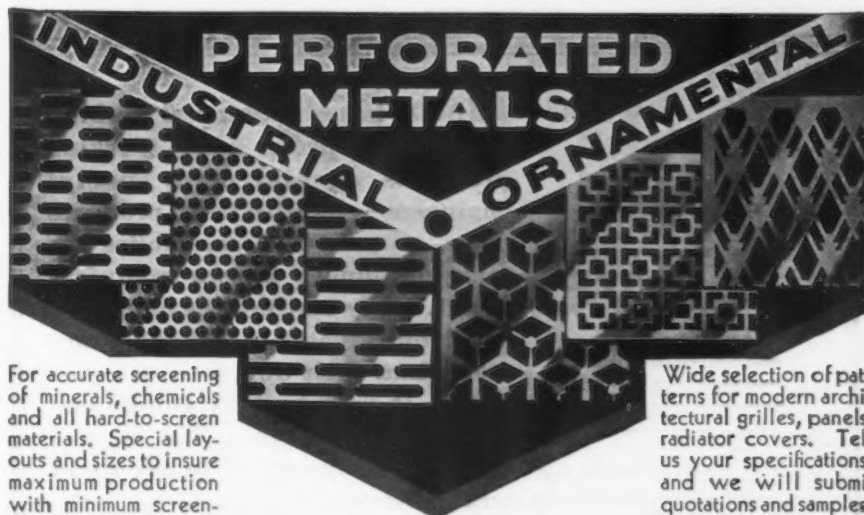
Representative Miller of Arkansas, head of the sub-committee, on asking those attending the hearing if they were opposed to or favored the bill, received no response.

1936 Post-War Peak of German Metal Industry

THE non-ferrous metal industry of Germany in 1936 experienced its most active and eventful year since the World War, according to a report from American Consul Sydney B. Redecker, Frankfort-on-Main, made public by the Depart-

ment of Commerce. With production proceeding at even a more rapid rate than during the two preceding years and under the stimulus of the demand created by the rearmament program, public works construction, the building of private dwelling houses, there resulted an activity surpassing even that of 1928-29, the report states.

Due largely to the national policy



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of replacing imports by domestic raw materials whenever possible, heavy gains have been recorded in the output of light metal, notably aluminum and magnesium. Likewise, there has been a steady shifting away from the use of copper and tin, which must be imported.

That there has been a marked gain in Germany's consumption of aluminum is reflected in the heavy expansion of the country's imports

of bauxite. Extensive research is being conducted by German producers to develop processes for the utilization of domestic low-grade clay for producing aluminum, the report states.

As to German importations, the United States does not seem to figure very largely as a source of zinc, lead, or copper. In 1936, the United States was fifth on the list of suppliers of new copper, but

second as a supplier of old and scrap copper, according to the report.

Armco to Double Apprentice Training

WITH a view to the prospect of an increasing need for skilled labor in the conduct of its operations, the American Rolling Mill Co. within the next 30 days will practically double the number of apprentices enrolled under its apprentice training program. The program was inaugurated in October, 1936, to train young men to become all-around, skilled journeymen in their respective trades.

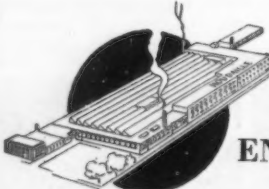
The training course provided for apprentices covers a period of four years and is conducted in cooperation with the International Correspondence Schools of Scranton, Pa. The subjects studied by each apprentice are selected to fit the particular trade or craft he plans to pursue. At the present time the program includes apprentices in the carpenter and tin metal working shop, the machine shop, electrical repair shop, welding shop, rigging shop, pipe shop, blacksmith shop, and power and boiler house.

The program is conducted under the direction of an apprentice supervisor, who maintains close personal contact with the individual apprentices and their problems, and is responsible for correlating classroom studies with work in the shops. Textbooks and lesson papers are furnished by the International Correspondence Schools, and lessons and examinations are sent to the I.C.S. for correction. Each apprentice spends from 8 to 10 hr. a week in classroom and home study. From 36 to 44 hr. a week are spent by the apprentice in the shop, engaged in actual production.

Young men selected by the American Rolling Mill Co. for enrollment in the apprentice training program must be between 18 and 20 years old, and must have a high school education or its equivalent. Apprentice training programs are now in effect in all of the American Rolling Mill Co.'s major plants.

Pittsburgh Steel Co. reports for the quarter ended March 31, 1937, net profit of \$489,743, equal, after dividend requirements for the period on the preferred stock, to 86c. a share on common stock. This compares with \$261,870, or 22c. a share on common stock, in the December, 1936, quarter.

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French Pig Iron Hit By Supplies Shortage

PIG iron producers in France experienced their greatest difficulty in March in obtaining adequate supplies of coke, iron ore and scrap iron, but the tension eased up some toward the end of the month, according to reports made to the United States Department of Commerce. Activity in pig iron production reached the highest level in several years, although still below that which prevailed in 1929. This condition is attributed to the fact that blast furnaces have been temporarily exempted from the application of the 40-hr. week. Of the 211 blast furnaces in existence in France, only 88 were in operation during the month, however, and four were relighted in January.

With the rising world prices of pig iron, certain French producers are covering the needs of the French market first, thus leaving little or no surplus for export. Pig iron production during February of 574,000 metric tons compared with 590,000 tons in January and 500,000 tons in February, 1936. That of steel ingots, by comparison, totaled 624,000 tons as against 607,000 and 538,000 tons respectively.

French demand for scrap, according to another Department of Commerce report, continued to become more intense during March. In spite of the export tax of 30 fr. per 100 kg., which virtually prohibits exportation, the demand for scrap iron far exceeds the supply, and prices continue to increase.

Exports of iron ore from France during the initial two-month period of 1937 totaled only 3,000,000 metric tons as compared with 3,465,000 tons during the corresponding period in 1936. The outstanding purchasers were Belgium, 1,789,000 tons, and Germany, 1,118,000 tons.

British Steel Imports Rise with Ingot Rate

IMPORTS of iron and steel products into the United Kingdom during March aggregated 94,281 tons as compared with 82,896 tons in the preceding month, according to word received by the Department of Commerce from Assistant Commercial Attache Homer S. Fox, London. A slight gain was registered in receipts of pig iron and it is stated that during the first three months of the current year, imports amounted to 260,125 tons of pig iron against 373,652 tons in

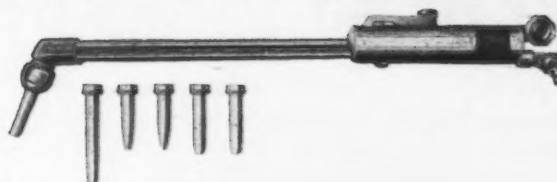
the like period of 1936. Exports continued to expand and they reached 231,557 tons in March against 200,498 tons in February and 163,412 tons in March, 1936.

Shortage of pig iron in the British Isles is becoming steadily more acute, according to a recent issue of the "Financial Times." It is stated that concern regarding future supplies is being displayed by consumers, whose needs show no signs of diminishing. It is stated that

energetic attempts are being made to increase output by putting blast furnaces which have been superseded by more modern plants into operation.

Mr. Fox also advises that important developments in the iron and steel industry in the United Kingdom in March included a new "all time monthly record" in steel ingot production, and the carrying out of a number of measures designed to improve the raw material sup-

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ply situation and generally place the industry in a better position to cope adequately with the exceptional demand for iron and steel products. Pig iron was placed on the free list and the import duty on quota imports of iron and steel products was reduced from 20 to 10 per cent *ad valorem*, and certain steel bars were made duty free.

Production of steel ingots and castings reached a new peak monthly level in March, at 1,109,500 tons, the previous high of 1,060,500 tons having been established in October, 1936. Incidentally, March was the fifth month in which the steel ingot output exceeded a million tons. Pig iron output increased from 603,700 tons in February to 680,300 tons in March and represented the highest monthly output over a number of years. Five furnaces were blown in during the month and three ceased operations.

Railway Age in April, 1937, reported a total of 84 locomotives on order, as compared with 15 in April, 1936; 13,046 freight cars in April this year compared with 3650 last year; and 52 passenger cars this year as against 50 cars in the same period in 1936.

First Quarter Steel Output Up 14 Per Cent to 11,347,300 Tons

REFLECTING a spectacular demand from consumers since the first of the year, production of finished and semi-finished steel during the first quarter staged a 14 per cent pick-up over the fourth quarter of 1936 to 11,347,300 tons, which is equivalent of 84.6 per cent of the finishing capacity of the entire industry. These figures compare with a production of 9,964,895 tons in the last quarter of 1936, representing the use of 76.4 per cent of the country's finishing capacity.

According to the figures supplied by the American Iron and Steel Institute, total sheet output in first quarter aggregated 2,283,091 tons, as compared with 2,102,076 tons in the previous quarter; tin plate production rose from 538,124 tons to 585,073 tons in the first quarter; output of all types of bars rose from 1,748,804 tons to 1,845,649 tons; hot and cold rolled strip rose from 865,486 tons to 927,193 tons; plates were up from 655,664 tons to 808,313 tons; and rails and track supplies advanced from 317,332 tons to 644,699 tons.

Sheet production in first quarter averaged 89.9 per cent of capacity, as compared with 94.2 per cent of capacity last quarter (ad-

ditional finishing capacity has been placed in operation); tin plate production averaged 81.2 per cent of capacity (there was new capacity added here also), as against 81 per cent for the last quarter; bar output averaged 57.5 per cent of capacity, as against 53.9 per cent in the preceding quarter; and plate activity averaged 48.7 per cent, as compared with 40.9 per cent last quarter.

Export shipments were up almost 100,000 tons during the quarter, rising from 336,789 tons in the last three months of 1936 to 403,948 tons in the first quarter of 1937. Tin plate was by far the most active export item, totaling 86,348 tons.

CIO Contract Not Needed, Says Republic

CLEVELAND, May 11.—Republic Steel Corp. executives, after a conference today with representatives of the CIO, told the union committee that the company, in view of the Wagner Act, sees no necessity for signing the contract submitted by the union. In the conference, it was pointed out to the CIO representatives that wages, hours, safety provisions, vacation plans, seniority rules and methods of handling grievances specified in the contract are no more favorable than those now enjoyed by Republic employees.

U. S. Steel Shipments Off Slightly in April

SHIPMENTS of finished steel products by subsidiary companies of the United States Steel Corp. amounted to 1,343,644 tons in April.

This was a decrease of 70,755 tons from the preceding month, and an increase of 363,737 tons over April, 1936.

April, 1937, shipments were the highest for any April since 1929, when shipments were 1,498,330 tons.

For the four months of 1937 shipments of finished steel products amounted to 5,041,685 tons, compared with 3,161,188 tons in the like period in 1936, an increase of 59 per cent.

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PERSONALS

(CONTINUED FROM PAGE 81)

Pittsburgh territory for the Yarnall-Waring Co., Philadelphia. FRED WETHERILL has joined the company as sales engineer in the impulse steam trap division.

COLLIER ELLIOTT has become identified with Peter A. Frasse & Co., Inc., New York.

JOHN F. WALTON, JR., secretary and treasurer of the Aluminum Goods Mfg. Co., Manitowoc, Wis., has resigned, effective June 1, to become vice-president of the M. B. Suydam Co., Pittsburgh, manufacturer of paints and varnishes. He formerly was an executive of the Aluminum Co. of America at Pittsburgh, going to Manitowoc in 1933 to succeed the late Richard J. Findlan.

TYLER W. CARLISLE has been elected president of Strong, Carlisle & Hammond Co., Cleveland,



T. W. CARLISLE

dealer in machinery and mill supplies, to fill the vacancy caused by the recent death of Herbert W. Strong. He had been vice-president. L. J. HAMMOND has been elected chairman of the board. Mr. Hammond, who served for several years as president of the company, retired about 10 years ago because of poor health, but will again take an active part in the affairs of the company. GEORGE J. ZIMMERMAN has been elected vice-president and will continue in charge of machinery sales. J. J. STEPHENS and R. L. KEECH have been reelected treasurer and secretary respectively.

L. A. BEDARD has been made manager of sales of the Mt. Ver-

non Car Mfg. Co., Mt. Vernon, Ill. H. H. CUST has resigned as vice-president and secretary.

GEORGE E. WHITLOCK has been elected president of Mullins Mfg. Co., Salem, Ohio. He has been vice-president of the City Auto Stamping Co., Toledo. HENRY A. ROEMER, president Sharon Steel Corp., has been elected chairman of the board. The Youngstown Pressed Steel Co., Warren, a subsidiary

of the Sharon Steel Corp., recently was merged with the Mullins company.

HARRY F. VICKERS has been announced as the new president of Vickers, Inc., Detroit, which recently became part of the Sperry Corp., New York. In other regards, the management of the company will continue as in the past and with no changes in policy, it was stated.

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A Metal Cutting Test Method For Machine Shop Use

(CONTINUED FROM PAGE 41)

results caused by irregularities in the billet material.

It is usual, in any event, to make cutting tests by using the tools in sequence. By this method the test runs based on the use of a given tool, or a given cut, are separated as far as possible. For example, if six tools are to be used, and six different cuts, one cut would be taken with the first tool, the second with the second tool, and so on until six have been taken. The series would then be repeated, but in a slightly different sequence, so that no cut would be repeated using the same tool previously used for the same cut. The method can be extended indefinitely until a sufficient number of test points has been secured. An average of the cutting speeds for each particular cut, after they have been reduced to a common life basis, gives a result which tends to average out the effect of variations in machinability of the billet, or of effectiveness of the tools, particularly if a number of points be taken. Each test cut should be repeated from four to ten times, to insure precision in the final test data.

Eliminating Uncertainties Caused by Billet Irregularities

There is a third method, which has been seldom used, that makes it possible to eliminate much of the uncertainty caused by irregularities in the test billet. The series of experimental cuts are taken in sequence, as described above. They are then plotted, showing the rela-

tionship of one of the variables being considered to the other. It is usually advisable to make this plot on double logarithmic coordinate paper, since it has been found that most metal cutting relationships tend to have a hyperbolic relationship, which may be represented on such coordinate paper by a straight line. In most instances a tentative formula may be set up which represents the relationship between the variables with some accuracy. This formula will usually have the form:

$$X = KY^n \quad (\text{Formula 2})$$

where

X = one variable

Y = second variable

K = a constant, determined experimentally

n = an exponent, equal to the tangent of the angle made by a straight line plot on double logarithmic coordinate paper

This formula may then be reduced to the form

$$K = \frac{X}{Y^n} \quad (\text{Formula 3})$$

The values of K should be calculated for all test points, and plotted according to their position on the test billet. For example, in the case of a large billet, the test cuts could be identified as being in the left-hand, center, or right-hand thirds, taken longitudinally, and in annular rings of which the inside and outside diameters vary by even inches. This break-up is only a

suggestion, as the longitudinal divisions may be fourths, fifths, or even more, while other differences in diameter may be used. On a billet 96 in. long and 15 in. in diameter, five longitudinal divisions, and differences of 1 in. on the diameter have proved very satisfactory.

The values of K so calculated may then be plotted according to the annular ring in which the particular cut was taken, and then an average obtained for each ring. When the work has been carefully done, these averages represent with some accuracy the relative machinability of the various annular rings, and may be used to correct the test results for this variation in machinability. These corrected results may then be used to obtain the desired relationship with considerable accuracy.

This method is believed to be original with the author, who has used it in obtaining relationships in which the variation is less than 10 per cent, when the billet used varied more than 30 per cent in machinability. Fig. 2 shows an application of this method in determining the effect of tool life under cut on cutting speed when cutting cast iron with high-speed steel tools. The upper curve shows the points as measured experimentally, while the lower curve shows the effect of correction for variations in machinability.

Choosing a Test Billet

When it is desired to study the effect of changes in tool material, heat treatment, or form; depth of cut; feed; kind and quantity of cutting fluid; or tool life on cutting speed, it is usually possible to make a choice of the material to be used for the test billet. It has been found that a large billet, of a



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spheroidized, medium carbon steel gives excellent uniformity, although it is difficult to secure this uniformity completely through the billet. It is desirable to discard the billet for test purposes when its diameter has been reduced approximately 75 per cent. A normalized nickel steel, containing approximately 0.40 per cent carbon and 3½ per cent nickel is used as a test billet by some authorities.

A cast billet should be in tubular form, with the shell not more than 3 or 4 in. thick, to improve the uniformity throughout the section. A gray iron casting, possibly containing some nickel, having a Brinell hardness of approximately 175 is well adapted for metal cutting experimental work.

Little Equipment Needed

Metal cutting experiments that will produce results of a high degree of precision may be carried on in any machine shop by employing the methods outlined above. Little is needed in the way of equipment beyond a machine of reasonable capacity and power, a set of cutting tools which have been carefully treated to secure uniformity, a supply of material to be cut of reasonable uniformity, a calibrated cutmeter, a stop watch, and, if possible, a portable Brinell hardness tester. The Brinell instrument is not absolutely necessary and a watch having a second hand may be used in place of the stop watch.

The manner in which the experiments are carried out, particularly the extent to which all variables not being investigated are held constant, and the manner in which the experimental results are analyzed, are far more important than the type of equipment employed.

G-E Traveling Switchgear Exhibit

A TRAVELING exhibit of the most recently developed switchgear equipment, sponsored by General Electric, and featuring working models of oil-blast circuit breakers and various types of metalclad switchgear, opened at the Hotel Ambassador, New York, May 3. Designed as a practical demonstration of the advantages of modern circuit-interrupting apparatus, the exhibit will be shown to leading central station, industrial, and transportation executives

in key cities throughout the country.

The exhibit places particular emphasis on the oil-blast principle of circuit interruption in oil-circuit-breaker construction and on silver contacts and modern arc-quenching devices in air-circuit-breaker design as a highly effective means of reducing the time involved in arc interruption and meeting today's requirements for more compact equipment.

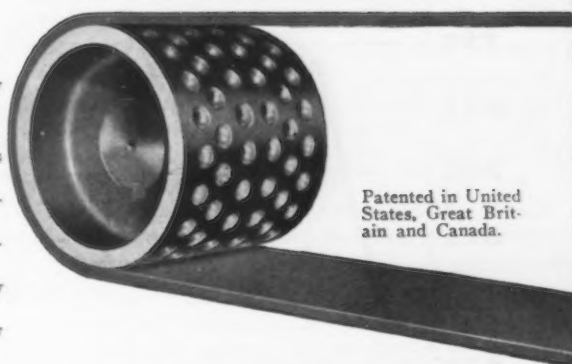
Models of large metal-clad

equipment are utilized to show how this type equipment promotes safety and convenience through mechanical interlocking and factory assembled units. Among the many cities to be visited within the near future are Newark, New Haven, Hartford, Albany, Syracuse, Rochester, Buffalo, Binghamton, Erie, Cleveland, Cincinnati, Columbus, Chicago, Louisville, Evansville, Indianapolis, Chattanooga, Fort Wayne, Toledo, Akron, and many other cities.

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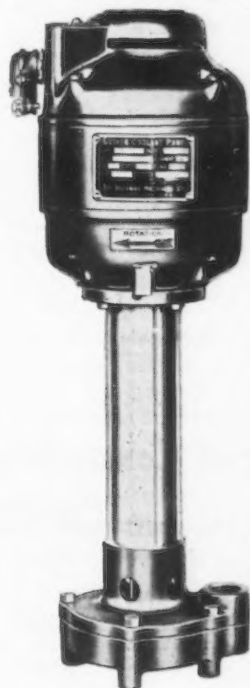
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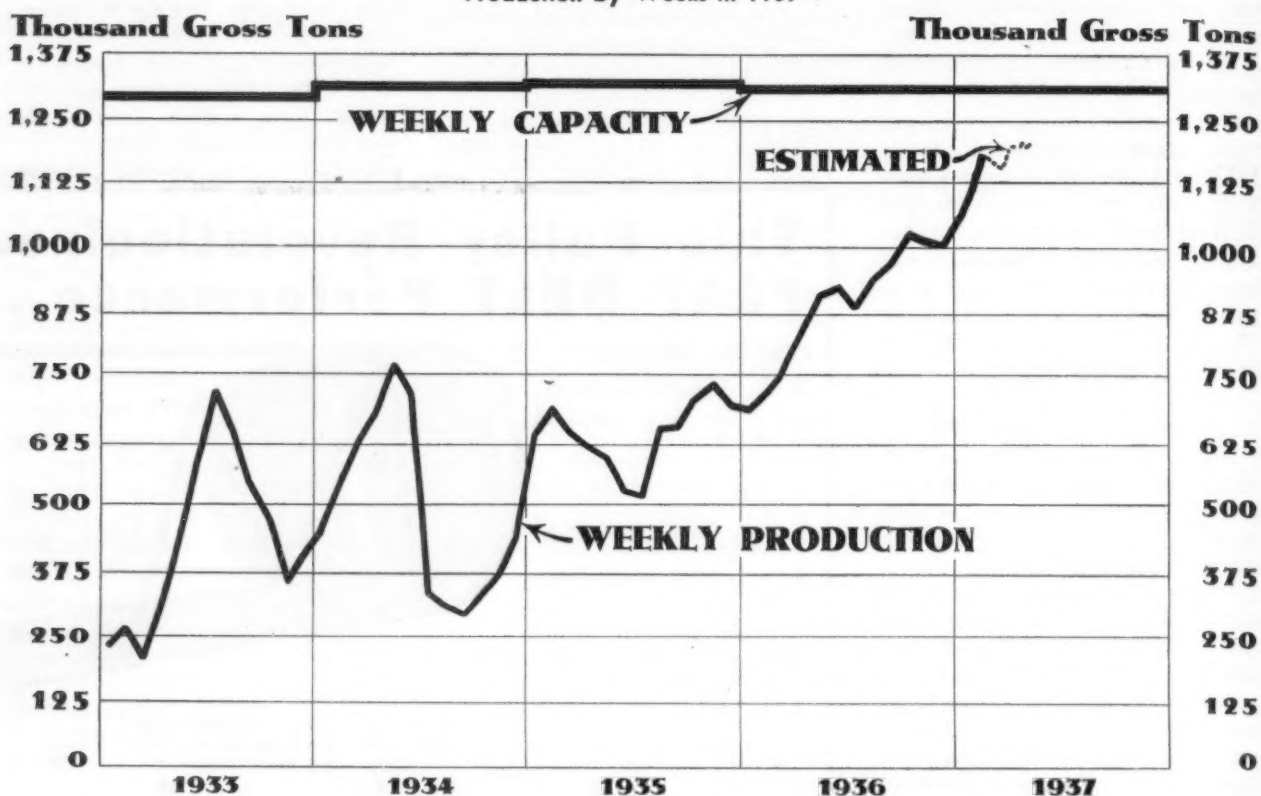
are modern, and are built along the lines of the highest grade machine tools, to give most dependable service. Gusher Pumps are guaranteed to satisfactorily handle liquid containing gritty substances.

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PRODUCTION

Average Weekly Production of Open-Hearth and Bessemer Steel Ingots by Months, 1933-1937, and Estimated Production by Weeks in 1937



Figures for the Current Week Are Not Indicated on the Chart Until the Following Week

STEEL INGOT PRODUCTION BY DISTRICTS: Per Cent of Capacity

District	Current Week	Last Week
Pittsburgh	94.0	94.0
Chicago	86.0	85.0
Valleys	87.0	89.0
Philadelphia	71.0	70.0
Cleveland	88.0	86.0
Buffalo	91.0	93.0
Wheeling	98.0	98.0
Southern	75.0	75.0
Ohio River	92.0	90.0
Western	95.0	95.0
St. Louis	90.0	90.0
Detroit	100.0	100.0
Eastern	90.0	98.0
Aggregate	92.0	92.0

Weekly Booking of Construction Steel

	May 11, 1937	May 4, 1937	Week Ended April 13, 1937	May 12, 1936	Year to Date 1937	1936
Fabricated structural steel awards.....	15,970	18,850	42,300	21,315	464,115	383,030
Fabricated plate awards.....	315	1,095	0	6,960	57,095	122,190
Steel sheet piling awards.....	0	970	0	150	16,530	15,700
Reinforcing bar awards.....	16,415	2,760	5,020	3,710	83,460	145,920
Total Lettings of Construction Steel....	32,700	23,675	47,320	32,135	621,200	666,840

...SUMMARY OF THE WEEK...

... *New business continues to taper off slightly, but production keeps up.*

o o o

... *Prospects for third quarter appear promising in view of heavy consumption.*

o o o

... *Steel scrap decline not checked, with drop of \$1.50 at Chicago.*

PRODUCTION of steel continues at a high rate, but most consumers find that their present stocks or commitments are ample to take care of their nearby requirements, and consequently the volume of new business is still shrinking moderately. Consumption is heavy, however, in many lines, with the result that current orders represent actual requirements.

It is estimated at Pittsburgh that new business in the past two weeks has been about 70 to 75 per cent of shipments. Some of this is for third quarter, but a good deal of it is fill-in tonnages that the mills are now able to take for shipment in late May or June. Deliveries have become easier on some products, but only to a minor extent.

Strike threats against some of the leading independent steel companies, which may come to a head this week, have had no discernible effect upon new steel purchases, but may account for renewed pressure on mills for quicker deliveries. At Chicago, business has improved sufficiently over the preceding two weeks to bring about a slight rise in the steel production rate. On the other hand, there have been minor gains and losses in other districts which about offset each other, leaving the rate for the country at 92 per cent, the same as last week.

Prospects for third quarter are fairly promising, with indications that the summer letdown may be less than might be expected in view of the heavy production of the first half of the year. One company, whose products are largely flat-rolled steels, estimates that orders now on its books for third quarter are equal to a 60 per cent operation through

that period, and that additional business logically to be expected will assure an activity considerably above that figure. Forward buying is proceeding at a steady pace, but without the excitement that accompanied second-quarter buying, as the price incentive has been removed.

BUSINESS was aided in the past week by fresh releases from some of the automobile companies, the placing of steel for recent construction awards and for railroad equipment and by a rising demand for steel in the farm equipment industry. Demand for farm machinery, including tractors, has risen far beyond the expectations of the manufacturers in that field; an example of this is that schedules for the new small combines have been repeatedly revised upward. Manufacturers of heating equipment and miscellaneous household appliances are also extremely busy.

Building construction is lagging in the investment type of structure, but is fairly sizable in bridges and other forms of public work and in the industrial field. The \$40,000,000 expansion program announced by General Motors Corp. and a smaller outlay by the Chrysler Corp. are indicative of a trend of lesser proportions in other industries; for example, a paper plant at Houston, Tex., that will take 2350 tons of steel and a \$1,300,000 program of a business machines manufacturer. Structural steel lettings were only 16,000 tons, but new projects amounting to 21,000 tons appeared in the market. Awards of concrete reinforcing bars totaled 16,500 tons, of which 6000 tons is for department store additions in Chicago.

While automobile output may have reached its peak for the year, a continuation of the present large volume of assemblies through the next two months, at least, is expected. Steel shipments to the automobile industry are not as large as current motor car production would seem to warrant, leading to the assumption that banks of manufactured parts, accumulated during the labor troubles, are being heavily drawn upon.

STEEL scrap prices have continued their downward trend, the sharpest drop occurring at Chicago, where a sale to a consumer was at \$1.50 a ton below the previously published price. There have been declines also of 50c. a ton at Pittsburgh and Philadelphia, bringing THE IRON AGE steel scrap composite price down to \$18.75 and marking the fifth consecutive weekly decline in this figure, totaling \$3.17 from the peak of \$21.92 of April 6. There has been a \$4 decline within that period at both Pittsburgh and Chicago and \$1.50 at Philadelphia, where export sales have served as a cushion.



...PITTSBURGH...

... Incoming business less than shipments, but operations remain at high level.

o o o

... Some buyers trying to get quicker deliveries, possibly in fear of labor disturbances.

o o o

... Heavy melting scrap down 50c. a ton; pig iron strong, shipments heavy.

PITTSBURGH, May 11.—Although incoming business is considerably below the tonnages placed in March, there has been a steady flow of orders for finished steel products during the past two weeks. The volume of new business may be roughly estimated at 70 to 75 per cent of shipments, which, combined with orders already on the books, prevents producers from rapidly reducing backlogs. Operations in the Pittsburgh district are unchanged at 94 per cent, while the Wheeling district remains at 98 per cent.

Business being placed on the books at this time represents actual requirements and this trend may be expected to continue. There has been no apparent falling-off in ultimate consumption. Some products, such as hot rolled and cold finished bars, if anything, are a little more in demand than a week ago owing to an increase in automobile specifications. Sheet bookings continue at a rate equivalent to shipments. Consequently there is little, if any, change in backlogs.

Concrete bar awards were exceptionally good this week and include several large-sized rail steel bar projects. Carnegie-Illinois has been awarded the contract for 1450 tons of billet steel reinforcing bars for a reclamation project at Odair, Wash. The American Bridge Co. will supply 4100 tons of plates and shapes for an international bridge at Clayton, N. Y.

Despite the fact that new orders have fallen off somewhat in the

past month, most customers are endeavoring to get more prompt shipments of orders on the books. The possibility of labor disturbances is growing in view of threats made by union members in at least three independent steel companies' plants, but it is expected that the situation will be clarified some time this week.

The raw material markets are spotty, with pig iron strong, but No. 1 heavy melting is off 50c. a ton.

Pig Iron

Pig iron production continues at an exceptionally high rate, with little indication of a recession. The leading producer has blown in a furnace which has been idle since 1933. Local producers are indifferent to the majority of foreign inquiries reaching this district. Some sales have been closed recently, among which was an order for 25,000 tons to be shipped to Japan by a Valley interest. Jobbing foundry business is good and a substantial tonnage of iron is being consumed by ingot mold makers, whose orders are being maintained at a high level.

Semi-Finished Steel

The unprecedented demand for sheets and tin plate is being adequately reflected in specifications for sheet and tin bars. Specifications for these items are heavy and there appears to be no slackening in sight. In fact, it is a question of supplies rather than demand as

most producers still find it necessary to allocate tonnages. The movement of wire rods is also good, with practically all material being ordered for immediate consumption. Total semi-finished bookings in the past week are larger than in the previous period.

Bolts, Nuts and Rivets

Releases from automobile manufacturers are slightly better this week, and it is expected that this trend will continue. Railroad car builders continue to represent a large portion of the present buying. Fabricating orders continue spotty and on the whole fresh business is not much better than a week ago. While no formal announcements have been made with respect to third quarter prices, no material changes, if any, are anticipated.

Bars

Hot rolled bar bookings in the past week, if anything, have been slightly better than in the previous period. Some of this improvement has been due to better automobile releases. On the other hand some jobbers have been in the market for sizes on which they are short. Farm implement and machine makers' specifications are in good volume. Despite the talk of heavy inventories, producers in this district continue to have pressure exerted upon them for more prompt shipments. Backlogs for the most part still average four to six weeks. The leveling off of specifications, which began about three weeks ago, is finally reflected in rolling mill schedules. Mills are welcoming this change as it enables them to ship more in line with customers' requirements.

Steel Sheet Piling

Projects requiring a total of approximately 15,000 to 20,000 tons of steel sheet piling are in the bidding process and will probably be awarded within the next 30 or 40 days. The number of miscellaneous jobs involving less than 100 tons is in fair volume. Bids will be taken on May 12 for a second bulkhead at Jacob Riis Park, New York, requiring 900 tons of piling.

Cold-Finished Bars

Aggregate specifications in the past week are better than in the previous period, owing to better automobile bookings. The increase in business, however, is not necessarily restricted to automotive purchases as sewing machine manufacturers and farm implement makers have entered a fair volume of orders. Total business, however, is not

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous;
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	May 11, 1937	May 4, 1937	Apr. 13, 1937	May 12, 1936
Rails, heavy, at mill.....	\$42.50	\$42.50	\$42.50	\$36.37 1/2
Light rails, Pittsburgh.....	43.00	43.00	43.00	35.00
Rerolling billets, Pittsburgh.	37.00	37.00	37.00	28.00
Sheet bars, Pittsburgh	37.00	37.00	37.00	28.00
Slabs, Pittsburgh	37.00	37.00	37.00	28.00
Forging billets, Pittsburgh..	43.00	43.00	43.00	35.00
Wire rods, Nos. 4 and 5, P'gh	47.00	47.00	47.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	2.10	2.10	2.10	1.80

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	2.45	2.45	2.45	1.85
Bars, Chicago	2.50	2.50	2.50	1.90
Bars, Cleveland	2.50	2.50	2.50	1.90
Bars, New York	2.78	2.78	2.78	2.20
Plates, Pittsburgh	2.25	2.25	2.25	1.80
Plates, Chicago	2.30	2.30	2.30	1.85
Plates, New York	2.53	2.53	2.53	2.09
Structural shapes, Pittsburgh	2.25	2.25	2.25	1.80
Structural shapes, Chicago..	2.30	2.30	2.30	1.85
Structural shapes, New York	2.5025	2.5025	2.5025	2.06 1/4
Cold-finished bars, P'gh....	2.90	2.90	2.90	2.10
Hot-rolled strips, P'gh.....	2.40	2.40	2.40	1.85
Cold-rolled strips, P'gh.....	3.20	3.20	3.20	2.60
Hot-rolled annealed sheets, No. 24, Pittsburgh	3.15	3.15	3.15	2.40
Hot-rolled annealed sheets, No. 24, Gary	3.25	3.25	3.25	2.50
Sheets, galv., No. 24, P'gh..	3.80	3.80	3.80	3.10
Sheets, galv., No. 24, Gary..	3.90	3.90	3.90	3.20
Hot-rolled sheets, No. 10, Pittsburgh	2.40	2.40	2.40	1.85
Hot-rolled sheets, No. 10, Gary	2.50	2.50	2.50	1.95
Cold-rolled sheets, No. 20, Pittsburgh	3.55	3.55	3.55	2.95
Cold-rolled sheets, No. 20, Gary	3.65	3.65	3.65	3.05
Wire nails Pittsburgh	2.75	2.75	2.75	2.10
Wire nails, Chicago dist. mill	2.80	2.80	2.80	2.15
Plain wire, Pittsburgh.....	2.90	2.90	2.90	2.40
Plain wire, Ch'go dist. mill	2.95	2.95	2.95	2.45
Barbed wire, galv., P'gh....	3.40	3.40	3.40	2.60
Barbed wire, galv., Chicago dist. mill	3.45	3.45	3.45	2.65
T'n plate, 100-lb. box, P'gh.	\$5.35	\$5.35	\$5.35	\$5.25

Pig Iron

Per Gross Ton:	May 11, 1937	May 4, 1937	Apr. 13, 1937	May 12, 1936
No. 2, fdy., Philadelphia....	\$25.76	\$25.76	\$25.76	\$21.3132
No. 2, Valley furnace.....	24.00	24.00	24.00	19.50
No. 2, Southern Cln'tl.....	23.69	23.69	23.69	20.2007
No. 2, Birmingham†.....	20.38	20.38	20.38	15.50
No. 2, foundry, Chicago*....	24.00	24.00	24.00	19.50
Basic, del'd eastern Pa.....	25.26	25.26	25.26	20.8132
Basic, Valley furnace.....	23.50	23.50	23.50	19.00
Malleable, Chicago*	24.00	24.00	24.00	19.50
Malleable, Valley	24.00	24.00	24.00	19.50
L. S. charcoal, Chicago.....	30.04	30.04	30.04	25.2528
Ferromanganese, seab'd, car- lots	102.50	95.00	95.00	75.00

†This quotation is subject to a deduction of 38c. a ton for phosphorus content of 70 per cent or higher.
*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh....	\$19.75	\$20.25	\$22.75	\$14.75
Heavy melting steel, Phila...	19.25	19.75	20.75	12.75
Heavy melting steel, Ch'go...	17.25	18.75	20.75	12.75
Carwheels, Chicago	19.75	20.25	21.75	14.00
Carwheels, Philadelphia	21.25	21.25	21.75	13.75
No. 1 cast, Pittsburgh.....	19.75	20.25	20.25	15.25
No. 1 cast, Philadelphia....	21.25	22.00	22.75	14.00
No. 1 cast, Ch'go (net ton)...	15.25	16.25	17.75	12.00
No. 1 RR. wrot., Phila.....	19.75	19.75	20.50	14.75
No. 1 RR. wrot., Ch'go (net)	15.25	16.25	18.50	12.00

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt.....	\$4.60	\$4.60	\$4.60	\$3.65
Foundry coke, prompt.....	5.25	5.25	5.00	4.25

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn...	14.00	14.00	15.50	9.50
Lake copper, New York....	14.12 1/2	14.12 1/2	15.62 1/2	9.62 1/2
Tin (Straits), New York....	54.75	56.00	60.62 1/2	47.00
Zinc, East St. Louis.....	6.75	6.75	7.00	4.90
Zinc, New York.....	7.10	7.10	7.35	5.27 1/2
Lead, St. Louis.....	5.85	5.85	5.85	4.45
Lead, New York.....	6.00	6.00	6.00	4.60
Antimony (Asiatic), N. Y...	14.50	15.25	17.00	13.50

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

Finished Steel

May 11, 1937	2.605c. a Lb.
One week ago	2.605c.
One month ago	2.605c.
One year ago	2.097c.

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

	HIGH	Low
1937	2.605c., Mar. 9;	2.330c., Mar. 2
1936	2.330c., Dec. 28;	2.084c., Mar. 10
1935	2.130c., Oct. 1;	2.124c., Jan. 8
1934	2.199c., April 24;	2.008c., Jan. 2
1933	2.015c., Oct. 3;	1.867c., April 18
1932	1.977c., Oct. 4;	1.926c., Feb. 2
1931	2.037c., Jan. 13;	1.945c., Dec. 29
1930	2.273c., Jan. 7;	2.018c., Dec. 9
1929	2.317c., April 2;	2.273c., Oct. 29
1928	2.286c., Dec. 11;	2.217c., July 17
1927	2.402c., Jan. 4;	2.212c., Nov. 1

Pig Iron

\$23.25 a Gross Ton
23.25
23.25
18.84

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

	HIGH	Low
\$23.25, Mar. 9;	\$20.25, Feb. 16	
19.73, Nov. 24;	18.73, Aug. 11	
18.84, Nov. 5;	17.83, May 14	
17.90, May 1;	16.90, Jan. 27	
16.90, Dec. 5;	13.56, Jan. 3	
14.81, Jan. 5;	13.56, Dec. 6	
15.90, Jan. 6;	14.79, Dec. 15	
18.21, Jan. 7;	15.90, Dec. 16	
18.71, May 14;	18.21, Dec. 17	
18.59, Nov. 27;	17.04, July 24	
19.71, Jan. 4;	17.54, Nov. 1	

Steel Scrap

\$18.75 a Gross Ton
19.58
21.42
13.42

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	Low
\$21.92, Mar. 30;	\$17.92, Jan. 4	
17.75, Dec. 21;	12.67, June 9	
13.42, Dec. 10;	10.38, April 23	
13.00, Mar. 13;	9.50, Sept. 25	
12.25, Aug. 8;	6.75, Jan. 3	
8.50, Jan. 12;	6.43, July 5	
11.33, Jan. 6;	8.50, Dec. 29	
15.00, Feb. 18;	11.25, Dec. 9	
17.58, Jan. 29;	14.08, Dec. 3	
16.50, Dec. 31;	13.08, July 2	
15.25, Jan. 11;	13.08, Nov. 22	

of the proportion received in March and, as a result, backlogs are probably running from four to five weeks on the average. There is evidence that the automobile industry will supply the main impetus during the early summer months for cold finished bar specifications. It is anticipated that some automobile producers will be in the market soon for 1938 model requirements.

Reinforcing Bars

Reinforcing bar awards in the past week were rather impressive. Included in the total were rail steel concrete bar requirements aggregating 9500 tons. Of this total, 6000 tons was required for department store additions at Chicago and was awarded to Inland Steel Co. Carnegie-Illinois Steel Corp. was awarded 1450 tons of reinforcing bars for a Bureau of Reclamation project at Odair, Wash. New inquiries are good and involve large tonnages. Prices are firm and deliveries run no better than four to six weeks on new rollings.

Plates and Sheets

Specifications for structural plates and shapes in the past week are below those placed in the previous period. Plate deliveries are no better and promises are running from 8 to 12 weeks, depending on the size. New inquiries are about on a par with a week ago and are about evenly divided between public projects and plant and factory additions. American Bridge Co. was awarded the contract for the International Bridge at Clayton, N. Y., for the American crossing, requiring 4100 tons of plates and shapes. This company also will fabricate 710 tons of material for a highway bridge at Newark, N. J.

Sheets

Aggregate sheet specifications during the past week are about equal to the total placed the previous period. Incoming business is still equal to, and in some cases better than, either production or shipment, with the result that backlogs show no change. Recent automobile purchases have added to backlogs of cold rolled sheets, which are now obtainable in six to seven weeks. Some producers are sold out for their third quarter production on all items except cold rolled sheets and are accepting orders on the basis of price at time of shipment. Opinion in some quarters is that automobile makers will be entering specifications for their new models around July 1. It is also expected that fill-in orders for the present models will continue to reach the mills for the next month or two.

Owing to the delivery situation, many manufacturers are being forced to place specifications for their fall production programs.

Tubular Products

With consumption of oil-country goods at a high level, mills are under considerable pressure for more prompt delivery. As a result of this situation, producers have been unable to build up stocks to any extent. Backlogs are running four to six weeks and specifications for short runs of line pipe are in good volume. Consumption of standard pipe is being maintained at a good rate owing to factory and home building and when pipe mills get around to it they will be fairly busy replenishing their own and jobbers' stocks.

Strip

Strip steel specifications within the past week are slightly less than the preceding period and deliveries are a little easier. Incoming business is emanating from widely diversified sources and quite a few orders represent fill-in items from electrical appliance makers.

Wire Products

Production continues at an exceptionally high rate and mills notice no let-up in the pressure for less extended deliveries. Analysis of some plants show practically all shipments of manufacturers' wire going into immediate consumption. Furthermore, fresh orders for manufacturers' wire are up slightly from a week ago. Part of this improvement is attributable to the better volume of orders from automobile sources. Following a lull of several weeks, merchant wire item business has shown some improvement in the past week. While consumption at some points has been curtailed owing to farm work, no cessation has occurred in other areas where the ground is still too wet for spring ploughing. Building activity is being reflected in a good consumption of nails.

Tin Plate

Specifications for both general line can and packers' specifications are in excellent volume, and some producers have been forced to work more than the normal number of turns in order to complete business on the books. Consumption of general line can goods continues to increase.

Coal and Coke

Both the furnace and foundry coke markets are exhibiting more strength following a slowing in

activity last week. Shipments of beehive furnace coke to a large consumer, which were held up last week, have been resumed. Demand for beehive foundry coke has increased considerably in the past week, as most foundries have used up surplus stocks purchased in anticipation of labor trouble some time ago. Coal production, however, continues at a subnormal level as most consumers have not yet used up stocks accumulated previous to the signing of coal wage contracts. There is evidence that the CIO might attempt to use "captive mines" as a vehicle to force independent steel companies into signing a contract with the SWOC.



Bangor & Aroostook has applied for permission to issue \$420,000 equipment trust certificates to partly pay for seven passenger cars costing about \$307,000 to be purchased from Pullman-Standard Car Mfg. Co., and five locomotives to cost about \$350,000 to be bought from American Locomotive Co.

Southern Pacific has ordered two rotary snow plows with 12-ft. cut from American Locomotive Co.

Alton & Southern has ordered one 2-8-2 type locomotive from American Locomotive Co.

Godfrey L. Cabot, Inc., Boston, is inquiring for 20 35-ton steel covered hopper cars.

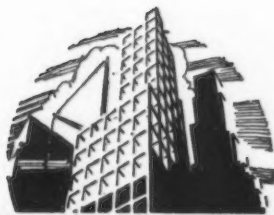
Chicago, Rock Island & Pacific is inquiring for 10 light-weight steel deluxe passenger coaches.

Gulf, Mobile & Northern is inquiring for two light-weight Cor-Ten steel sleeper coaches.

Wisconsin Central has applied for authority to issue \$1,200,000 in equipment trust certificates to finance purchase of rolling stock whose aggregate cost will be \$1,380,000. Equipment to be purchased and the builders are: Four steam locomotives, Lima Locomotive Works; 250 50-ton automobile cars, 100 50-ton all-steel gondola cars and 100 all-steel twin hopper cars, Pullman-Standard Car Mfg. Co. This carrier also has applied for authority to issue \$2,500,000 in equipment trust certificates to purchase, at a total cost of \$3,362,130, the following used equipment from the Soo Line: 638 ore, 1837 box, 100 gondola and nine combination baggage cars and 17 locomotives.

Edward G. Budd Mfg. Co., Philadelphia, has received an order from the Reading Co. for a light-weight, stainless steel, streamlined train, to be operated in the Philadelphia-New York service on a schedule of two round trips daily.

American Car & Foundry Motors Co. has received the following orders for motor coaches: One 28-passenger and one 36-passenger for Sacramento Northern Railway, Sacramento, Cal.; six 36-passenger for Eastern Michigan Motor Buses, Inc., Detroit; and eight 36-passenger for Florida Motor Lines, Inc., Jacksonville, Fla.



...NEW YORK...

... *Downward trend in steel buying continues.*

o o o

... *Backlogs still heavy, however, and deliveries are only slightly better.*

o o o

... *Export inquiry shows signs of falling off.*

NEW YORK, May 11.—The downward trend in orders for finished steel, which began to be observed a few weeks ago, has continued during the past week, when orders taken by most of the steel companies represented in this territory were the smallest in some months.

The decline in business has not as yet, however, caused any appreciable difference in mill deliveries except that occasional open spaces on mill schedules for delivery over the remainder of this quarter have made it possible to accept some orders.

Cold-rolled sheets seem to be one of the easiest products to obtain within a reasonable period. On the other hand, coated sheets are pretty well sold up, and some mills cannot take anything for this quarter. Semi-finished steel is almost un-

obtainable, as integrated mills require almost their full output for their own finishing mills. Some sizes of bars can be had within a few weeks, but other sizes are hard to get for delivery in this quarter. Plates and shapes are well sold ahead by the larger mills, but some of the smaller mills can take some tonnages for shipment within a few weeks. Some mills are losing business because their competitors can offer better deliveries.

While steel users are showing no haste in covering for their third-quarter requirements, some of the mills have a substantial tonnage booked for that period. Consumers seem to be convinced that there will be no such situation in the third quarter as existed during the first quarter, and are governed accordingly.

Export inquiry is lighter, particularly from European countries.

Pig Iron

The domestic market is still dormant as far as orders are concerned, although shipments are heavy. Many of the large consumers are well committed for iron, but the large bank of orders on the books of machine tool and textile machinery builders presumes that foundry stocks will not be allowed to be depleted.

Foreign inquiry is in lots of a few hundred tons, but in the aggregate is substantial. The recent purchase of the Japanese is said to have been at \$26.20 and \$26.30 f.a.s.

Reinforcing Steel

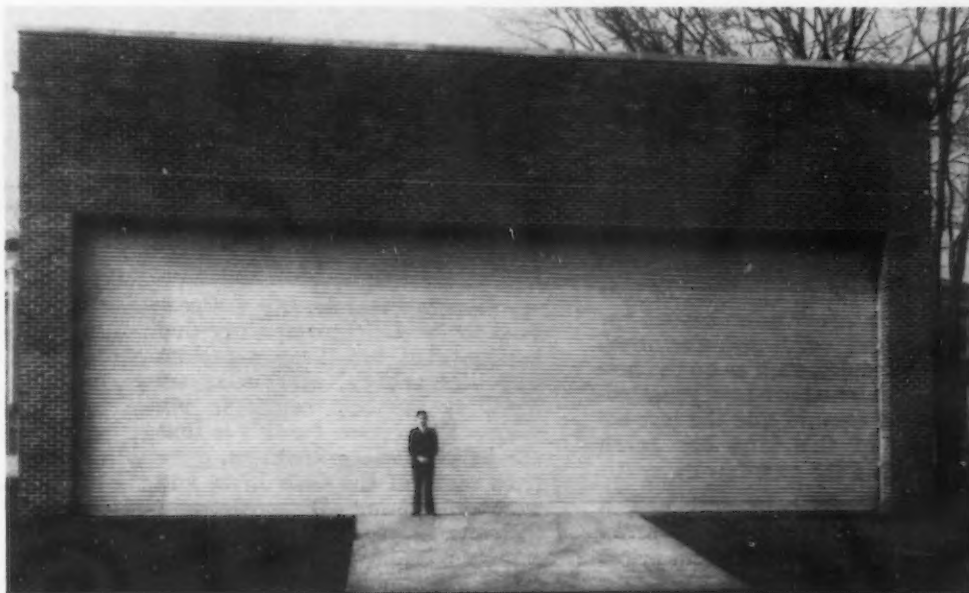
This market has been quiet. No awards have been reported and there is still an absence of important tonnages in pending projects. Bids were taken Tuesday on 360 tons of bars for a long-postponed section of the Sixth Avenue subway, and also for 130 tons of bars for a bridge over the Long Island Railroad at Glendale. The price status is unchanged.

New York to Build \$27,000,000 Tunnel

GOVERNOR LEHMAN of New York has signed a bill authorizing the New York City Tunnel Authority to build a vehicular tunnel across Manhattan at Thirty-eighth Street connecting the Queens Midtown Tunnel and the Lincoln Tunnel, which will provide through underground traffic routes between New Jersey and Brooklyn. The cost of the connecting tunnel will be about \$27,000,000.

WEIGHING approximately 10 tons, this steel rolling type door is one of the largest "one man" doors yet installed. It was built by the Kinnear Mfg. Co. for the aeronautical laboratory of the University of Alabama. The door is 46 ft.-8 in. wide and 16 ft. high. The drum on which the curtain coils when fitted with the springs and steel shaft weighs approximately 5 tons. Another interesting point is that the bottom bar on the curtain weighs approximately 1/2 ton by itself. The ends of the curtain are equipped with end-locks as well as large diameter roller wind-locks. The guides weigh approximately 1/2 ton apiece and are anchored to a two-foot wide base to provide greater strength against wind pressure.

o o o





CHICAGO

... Steel business shows improvement and ingot output rises.

o o o

... Farm equipment industry extremely busy and revising schedules upward.

o o o

... Scrap prices show further weakness; pig iron shipments heavy.

CHICAGO, May 11.—Despite an easier situation in the steel market, ingot production has regained lost ground and now stands at 86 per cent of capacity, an upturn of one point from last week. This is a direct reflection of specifications which have come back sharply from the drop at the turn of the month.

Much of this change is brought about by the heavy tonnage products, farm implement manufacturers playing a prominent part in the picture. New sales of finished steel also are making a better showing, though the total is low and backlogs all along the line are shrinking at rates which vary from 3 to 8 per cent a week. New open spaces are appearing in rolling schedules, and the improvement in deliveries is spreading to a greater number of products.

From all indications the change in the steel making picture is not indicative of what industry as a whole is doing, for the rate of consumption remains very high and many consumers frankly admit that they are now working down their supplies of raw stocks. The farm implement and tractor industries are striking examples of how markets can revive far beyond the expectations of manufacturers. Some schedules, such as on the new small combines, have been repeatedly revised upward and the last occurrence of this kind has taken place within the past few days.

Lack of short interest and a steady and heavy inflow of scrap are still bearish factors, and prices are being driven to new lows.

Pig Iron

May shipments are in good volume, considering that some melters are reducing stocks on hand and that some foundries are having labor difficulties and therefore are not making new commitments. New sales are on a spot basis at firm prices.

Reinforcing Bars

Much thought is being given by all concerned to the dullness of this market which at this season should present a rosy picture. Investment type of work is not coming out and so far explanations are centering around costs and the uncertain attitude of labor. About 500 tons has been purchased for the Acme Steel expansion, this tonnage being about half of that originally contemplated. Wisconsin is ordering steel for road work and Illinois tonnages are more numerous, but most of them are for use in southern Illinois and therefore do not reach local distributors. The strike at the Calumet Steel Co. plant is still on and many jobs are being held up.

Cast Iron Pipe

Sellers whose interests are confined to the Chicago territory find business dull, but those in contact with the national market report April as the best month in six years. The reason for this is that the bulk of going tonnages come from south of the Ohio River and west of Iowa. Disappointment with the Chicago area market results not from lack of expected maintenance business, which is

fairly close to normal, but from the lack of tonnage inquiries which give foundries real backlogs. Prices are firm.

Rails

Secondary buying is still intangible, but releases are heavy and mills producing at 60 per cent of capacity are shipping all possible tonnage, which is regulated by available raw steel. Current rollings are being allotted among the various railroads, which means that some of them are not getting as heavy shipments as they would like for the active track laying season. Production will remain steady for at least another 30 days. New orders for track accessories are limited to a few carloads.

Wire Products

Both sales and specifications are dragging, but mill operations are being held steady while producers attempt to take advantage of the situation and build up mill stocks which have been far from satisfactory for many months. Specifications do not indicate that consumption is running at low ebb, but rather that consumers are now busily engaged using their stocks which were acquired when the delivery situation was approaching its worst. Deliveries are now somewhat improved and the drift is in the direction of still more favorable promises of shipment. Producers' books are well filled for the remainder of the quarter. More vigorous sales efforts will soon be under way, and these will include announcements of fall terms to be effective about June 1.

Sheets

The tendency for open spots to appear on rolling schedules is spreading, as many large consumers turn away from new specifications toward the use of large accumulations now in their hands. Cold rolled sheets are a case in point, and some mills can now make much improved deliveries on the galvanized product. Sheets sales in farm areas are tapering under seasonal influences. There is an excellent movement of car roofing sheets to car builders and to railroad maintenance shops.

Structural Shapes

Private work is limited to a handful of small tonnages, the largest being 250 tons placed for an extension to the Acme Steel Co. plant at Riverdale, Ill. In the field of public work is the award of 1800 tons for an overhead crossing in Chicago and inquiries such as 5500 tons for a bridge in Louisiana, 2350 tons for a bridge at Jacksonville, Fla., and both Illinois

and Wisconsin have small bridge projects up for figures. Fabricators are entirely satisfied with the amount of bridge work coming out, but they are worried about the outlook for the investment type of structure.

Plates

Most plate mill shipments are flowing into the channels of railroad car building and bridge work. Pipe line news is scarce. Tank makers, though busy, are being forced to confine their efforts to small and special orders. The Union Pacific car inquiry is now the largest from Western railroads, but steel producers are more than confident that additional attractive business is to come in the near future.

Bars

Releases are turning upward, largely due to the farm implement trade, which is making production records and which reports no indicated letdown in sight in the near future. Bolt, nut and rivet manufacturers are enjoying excellent business, and road machinery builders and forgers are well engaged. Automobile plants are entering heavier specifications, but the feeling prevails that needs will soon turn lighter. Bar deliveries are slightly better from some mills.



... **Alabama coal shutdown ended by agreement.**

... **Mills still producing heavily against backlogs.**

BIRMINGHAM, May 11.—For the first time in more than five years, the Gadsden furnace of the Gulf States Steel division of the Republic Steel Corp. has resumed operations. Production was started on Sunday.

Announcement was made last week of a rail order from the Tennessee Central, amounting to 2250 tons.

Chicago Bridge & Iron Co. has booked four tanks, requiring about 500 tons of steel, from the Humble Oil & Refining Co., Baytown, Tex.

The Alabama coal shutdown was officially ended on Saturday, when

operators and the mine union reached an agreement. The end was foreseen earlier in the week when Sloss-Sheffield Steel & Iron Co., Woodward Iron Co., Alabama By-Products Corp. and the Black Creek Coal & Coke Co. signed contracts on the basis of the full Appalachian increase. On Friday the Tennessee Coal, Iron & Railroad Co. signed an agreement and then on Saturday the commercial producers fell into line. The new contract carries the Appalachian advances and is for two years.

The steel market continues fairly active. Sheets and wire products are quiet, but there is still a good current demand for bars, plates and shapes. The mills are still taxed to supply shipping requests on business already booked. last week and the same number will continue this week.



Godfrey L. Cabot, Inc., 77 Franklin Street, Boston, operating carbon black and pipe line properties, plans welded steel pipe line for natural gas transmission to new carbon black manufacturing plant at Pampa, Tex., where site has been acquired. Control station will be located at plant, which will include large compressors and other equipment.

Continental Oil Co., Ponca City, Okla., has plans for new 8-in. welded steel pipe line from Ainsworth, Kan., oil field district to Geneseo, Kan., about 35 miles, for crude oil transmission to last noted point. Cost over \$350,000, including booster pumping stations along route and other operating facilities.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until May 18 for 5250 ft. of black steel pipe (Proposal 398-150).

Texas Cities Gas Co., Galveston, Tex., has let contract to Kane Boiler Works, 2715 C Street, for fabricating about 8000 ft. of 14-in. steel pipe for replacements in existing lines.

Anderson-Pritchard Oil Corp., Oklahoma City, is considering about 14,000 ft. of 6-in. steel pipe line in N.W. Forty-first Street and Grand Boulevard, Oklahoma City, for crude oil transmission. A. H. McCall is company engineer.

Landreth Production Corp., Petroleum Building, Fort Worth, Tex., plans welded steel pipe line for natural gas transmission in connection with proposed natural gasoline plant in Aransas County, Tex., where site is being selected. Plant will have initial capacity for handling about 50,000,000 cu. ft. per day.

Constructing Quartermaster, Sacramento Air Depot, Sacramento, Cal., asks bids until May 24 for galvanized welded steel pipe (Proposal 6870-22).

Panhandle Eastern Pipe Line Co., Kansas City, Mo., has let contract to E. H. Reeder Construction Co., Dallas, Tex., for about 125 miles of welded steel pipe lines in parts of Missouri and Illinois for natural gas transmission, connecting with present main lines from Amarillo, Tex., natural gas field.

Franco Oils, Ltd., Lindsay Building, Winnipeg, Man., plans welded steel pipe line from Lloydminster to Edmonton, Alta., for natural gas transmission. Cost over \$100,000.

Los Angeles Metropolitan Water District, Los Angeles, will open bids May 17 on 20,000 ft. of 30-in. slip-joint water pipe of 10 gage sheet steel.

Los Angeles Department of Water and Power, Los Angeles, will open bids May 17 on 18,000 ft. of 6-in. water pipe.

Portland, Ore., will open bids May 20 on 184 tons of 30-in. steel pipe for a United States Treasury project.



... **Demand for sheets eases slightly.**

... **Prompt deliveries on cold rolled sheets.**

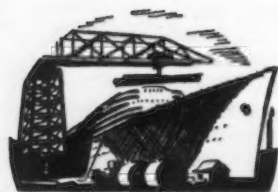
CINCINNATI, May 11.—Sheet steel demand, while still at high level, eased a bit the past week. Bookings into third quarter, so far, indicate a minimum operation of 60 per cent and, with tonnages swelling weekly, near capacity operations are anticipated. Cold rolled sheets can now be obtained promptly.

Steel production rose to about 91 per cent with the addition of one furnace. The Middletown unit of American Rolling Mill Co. is now operating all open hearths.

Pig iron users are specifying heavily against contracts. Inquiry for small amounts for next quarter has been received, but this may be merely a test of price trends.

Brazilian Manganese Ore Exports Rise

A **NOTEWORTHY** increase in exports of manganese ore from Rio de Janeiro, Brazil, during March, 1937, is shown in a report by American Consul Odin G. Loren, made public by the Bureau of Foreign and Domestic Commerce. Aggregate shipments of manganese ore from the port of Rio de Janeiro during March were reported at 28,454 long tons of which 14,549 tons were consigned to Baltimore, 1600 tons to Belgium, 6005 tons to France, and 6300 tons to Scotland. This compares with 15,042 tons shipped from this port during January and 4600 tons during February.



... PHILADELPHIA ...

... *New business continues fairly light.*

o o o

... *Deliveries are still unimproved, however.*

o o o

... *Operations increase one point to 71 per cent of capacity.*

PHILADELPHIA, May 11.—Deliveries are still not appreciably better, although new business is being received at a rate regarded by most sellers as less than normal. District mills report shipments slightly greater than orders, so that a reduction in the length of shipping promises would appear to be imminent, if present tendencies continue, although this improvement will undoubtedly be slow. A slight easing has already been noticed in shapes and bars, but deliveries of practically all other products are unimproved.

Sellers are now discovering what the trying days of March and early April made impossible to determine—the condition of their customers' stocks. Those who said even as late as last week that stocks were at a minimum are revising their statements now on the basis of conversations with buyers, who are deferring further orders until stocks are reduced somewhat, and a complete lack of interest among other users, whose business, however, seems not to have lessened at all. Jobber stocks are apparently not too heavy, as pressure from them for deliveries continues. With present backlogs, most of the buying today is for rather extended delivery.

Steel shipments to Philco Radio are still being held up because of the strike. A settlement is expected this week, as negotiations between management and the unions have been under way almost continuously since the strike began.

Figures continue to come out on the possible increase to the cost of steel production which would be caused by the contemplated Pennsylvania tax of 2c. a gal on fuel oil. Consensus of opinion is that \$2 to \$3 a ton would be added.

The Reading Co. has ordered a lightweight, streamlined stainless steel train from the Edward G. Budd Mfg. Co. for the Philadelphia to New York run.

No. 1 heavy melting steel is down 50c. a ton, largely because of weakness in Pittsburgh, and almost a complete lack of mill buying, although steel operations are up one point to 71 per cent of capacity.

Pig Iron

This market continues quiet, with very little iron available for second quarter delivery. The starting up of the Troy stack last Friday will add much needed output in that district, while the Riddlesburg unit is expected to be in blast by this time next week. Considerable foreign inquiry is still reported, but producers here are showing little interest. The move to increase the pig iron price is apparently making little headway. Some sellers are opposed to an advance.

Plates and Shapes

No improvement is noticed this week in deliveries of plates and sheets, although one plate seller who is currently promising shipment within six to eight weeks, may reduce this period to four to six weeks within a short time. Some salesmen state they are still losing business because of deliveries, some being able to promise from three to five weeks. Investigation however reveals that all mills and all sales offices are quoting more extended shipping periods than this, so that the explanation would seem to be the presence of open spaces on rolling schedules, rather than a lighter order book.

The best that can be done on plates, according to sellers' announcements, is about six weeks, while the worst is 14 weeks. The light gages of cold-rolled sheets are the easiest to obtain of all the sheet line, six to seven weeks being quoted, while heavier gages require from 22 to 23 weeks for shipment. Further new business is not being actively solicited either in plates or in sheets, mills wishing an opportunity to cut down their extensive backlogs.

Structural Shapes and Reinforcing Bars

Structural activity is still light in this district, no large jobs being reported. An airport hangar in Harrisburg requiring about 210 tons of shapes was awarded to Bethlehem Steel Corp., while 160 tons of plain unfabricated material for a bridge in Bucks County, Pa., is being purchased from Bethlehem also. A Reading, Pa., company, the Textile Machine Works, awarded 210 tons of shapes for the construction of a new plant at Wytheville, Va., to Bristol Structural Steel Co. The only large reinforcing steel tonnage pending is that to be required for the Philadelphia courthouse.

Imports and Exports

The following iron and steel imports were received here during the past week: 3974 tons of chrome ore from South Africa; 2987 tons of chrome ore from Cuba; 3700 tons of iron ore from Algeria; 13 tons of drill steel from Norway; 16 tons of steel billets, 66 tons of steel tubes, 40 tons of wire rods, 48 tons of steel forgings, and 34 tons of steel bars from Sweden.

"Exports of scrap from this district in April totaled 32,920 tons, as compared with 6610 tons in the same month last year. This amount constitutes a new high mark for such movement from this port."



... *Business quieter but mills have large backlogs.*

o o o

TORONTO, May 11.—Current steel orders are for spot delivery and future delivery booking has dried up. British contracts also have dropped off, but Canadian

steel interests state that they are well supplied with backlogs, some mills having enough to maintain capacity operations to the end of the year.

Merchant pig iron sales continue in good volume and have been augmented by scarcity of scrap. Local blast furnace representatives state that so far this year iron sales have reached the highest level since 1929 and present business points to continued demand for some time. There has been some stepping up of imports of iron from the United States following the advance in prices announced about a month ago by Canadian producers, but no iron has been imported from Great Britain for some time. Prices are firm and unchanged.

Consumers are showing keen interest in the scrap market and are pushing dealers for supplies. Small accumulators are scouring the rural districts for supplies. Dealers have made no further change in price lists, but some are quoting about 50c. a ton above list for material.



... Steel mill operations continue at high rate.

... Considerable structural work in prospect.

BUFFALO, May 11.—Steel mill operations are being maintained. Bethlehem's Lackawanna plant is operating 28 to 29 out of 30 open hearths; Republic, eight out of nine and Wickwire-Spencer Steel Co., two out of four.

Buffalo concerns will fabricate 110 tons of structural steel for a bridge to be built by the State Highway Department in Jefferson County and 175 tons for a Broome County State highway bridge.

The Pittsburgh-Des Moines General Contracting Co., is low bidder on a 1,700,000-gal. water tank for the village of Brockport, N. Y. This job will require 150 tons of steel plates.

While plans are not available from Detroit, measurements indicated for the new General Motors plant to be built at Lockport, should make this a 2000-ton structural steel job. An addition to Buffalo General Hospital will require 175 tons of structural steel.

The McDonald Engineering Co.

is low on the general contract for the Eastern States Milling Co. addition in the town of Tonawanda, adjacent to Buffalo. This job will require 500 tons of reinforcing bars.

Pig iron inquiry is quiet, but makers who attended the recent foundrymen's convention are led to believe that a new buying movement for third quarter material will develop by the end of the month. Most makers are inclined to the idea that there will be no price change.



... Mills still unable to accept all business.

... Premiums offered in Continental market.

LONDON, May 11 (By Cable).—Recent market reaction to advanced home iron and steel prices has been favorable. Cleveland pig iron prices have not yet been altered, and new business is suspended as the furnaces are heavily sold out, and are only accepting far forward home orders.

The position of rerollers has been eased by increased imports of Continental semi-finished steel, which are still below quota. Despite the huge output rolled, steel mills are unable to accept all business, though export buyers are offering big premiums.

The tin plate market is quiet. There have been some resales by second hands at lower prices, but works are firm and only open for far forward sales, as at present steel supplies are insufficient to meet current needs. Unfilled orders amount to 6,750,000 base boxes. Galvanized and black sheet makers are accepting only far forward orders, and are able to obtain large premium for export.

The Continental steel market is active and premiums up to 50s. gold have been offered. The deliveries on bars and plates are delayed five months.

The question of rise in prices in free markets is yet undecided. April bookings amounted to 237,000 tons of which 127,000 tons were for export.

There are no changes in British and Continental prices.



Metropolitan District Commission, Boston, has awarded 497 tons of pipe and fittings to Warren Foundry & Pipe Corp.

United States Treasury has awarded approximately 400 tons of 6 to 12-in. for city of Boston to United States Pipe & Foundry Co.

Niagara Falls, N. Y., has let contract to United States Pipe & Foundry Co., for pipe and specials for new water main in village of Lewiston, at \$70,534.72.

West Virginia Water Service Co., Charleston, W. Va., has authorized installation of about 12,100 ft. for extensions in water system.

Yanceville Sanitary District of Caswell County, Yanceville, N. C., Robert T. Wilson in charge, closes bids May 21 for three miles of 1 to 8-in., for water system; also for elevated steel tank and tower, and deep-well pumping machinery and accessories. A. C. Linberg, Burlington, N. C., is consulting engineer.

Augusta, Ga., plans pipe lines for extensions and replacements in water system. Special election has been called June 2 to approve bonds for \$400,000 for this and other waterworks installation.

Alice, Tex., closes bids May 17 for 9530 ft. of 6-in. for extensions in water system, including gate valves, valve boxes, fittings, etc. J. E. Ward, Wichita Falls, Tex., is consulting engineer.

Miami Beach, Fla., has let following contracts for pipe for new cast iron mains for ocean outfall: American Cast Iron Pipe Co., 108,700 ft. of 36-in. flexible and 5000 ft. of 36-in. B.&S. at \$113,700, and 25,000 ft. of 36-in. and 9300 ft. of 30-in. at \$34,000; United States Pipe & Foundry Co., quantity of 30-in. at \$199,000; Florence Pipe Foundry & Machine Co. (R. D. Wood & Co.), 1450 ft. of 24-in., 2450 ft. of 16-in., and 450 ft. of 8-in. at \$5350. Malcolm Pirnie, 25 West Forty-third Street, New York, is consulting engineer.

Eureka, Kan., is completing plans for waterworks installation, including about five miles of pipe lines, pumping station and other facilities. Cost about \$91,000. Financing has been arranged through Federal aid. Paulette & Wilson, National Reserve Building, Topeka, Kan., and Farmers' Union Building, Salina, Kan., are consulting engineers.

Quindaro Township Board, Quindaro Township, Wyandotte County, Kan., care of Charles A. Haskins & Co., Finance Building, Kansas City, Mo., consulting engineers, plans about 31 miles of 4, 6 and 8-in. for water system in Victory Junction, White Church and Wyandotte County Farm districts. Cost about \$278,000. Financing is being arranged through Federal aid.

Dresser Junction, Wis., has voted in favor of bond issue for new waterworks system to cost \$25,455; PWA loan and grant approved. A. H. Weinhardt is village clerk.

Pomona, Cal., has awarded 190 tons to National Cast Iron Pipe Co. for a water supply system.

Hawthorne, Cal., has awarded 102 tons of 2, 4 and 6-in. to National Cast Iron Pipe Co.



... CLEVELAND ...

... Steel demand continues to taper off, and backlogs are being reduced.

o o o

... Ingot output declines at Youngstown, but is slightly higher at Lorain.

o o o

... Manufacturers in many lines are still extremely busy.

CLEVELAND, May 11.—A further tapering off in the demand for finished steel is in evidence and, with high schedules still being maintained by nearly all finishing mills, shipments are considerably in excess of incoming business and backlogs on some products have been further reduced. Incoming business so far this month shows quite a decline as compared with the same period in April.

With deliveries growing better, consumers are doing less forward buying and, in addition, there are signs of a seasonal decline in the demand for finished steel. Less pressure for deliveries and reduced backlogs seem to account for a two point decline in the ingot output in the Youngstown district to 87 per cent of capacity this week. However, with the addition of another open-hearth furnace in Lorain, steel production in the Cleveland-Lorain district was stepped up two points to 88 per cent of capacity.

The outlook for good operations through the third quarter is quite favorable. No slackening in consumption of steel by manufacturing industries in this district is in evidence. Demand in the building field is fair. Business from railroads is slack.

New specifications from the automotive industry are only moderate, considering the high production schedules that motor car manufacturers are maintaining, and this leads to a belief that some of the automobile companies accumulated rather large stocks of steel and finished parts during their interruptions by labor trouble. Manufacturers of heating equipment and household appliances continue very busy and are taking good tonnages of sheet steel. Makers of power

shovels and agricultural implements are also keeping up high production.

The scrap market continues weak. The quotations on many grades have been further reduced.

Pig Iron

Shipments are slightly heavier than in April and foundry operations generally are being maintained at a high rate. New demand is very light and is not expected to develop in volume until books are opened for the third quarter around June 1. Interest in third quarter quotations seem to have died down since indications developed that there would be no price advance. Prices for the quarter may not be named until around June 1.

Sheets

While new demand is fair, orders are not equal to shipments and mills are cutting into their backlogs considerably. This is particularly true of cold rolled sheets, on which promises of deliveries in 10 days have been made, and a number of mills can now make shipments in two or three weeks. Some producers can take hot rolled and hot rolled annealed sheets for late June delivery, while others are filled up until the third quarter. Only one more purchase by the automobile companies for sheets for present models is expected. Some of the large buyers, particularly in the automotive field, have not specified for all the cold rolled sheet tonnages reserved for them by the regular suppliers and this is given as the principal reason for the present ability of mills to make quite prompt shipments. Demand from makers of household equipment continues heavy. Some of the refrigerator

manufacturers will be in the market shortly for sheets for new models to be brought out in July. Business from steel barrel manufacturers has improved.

Strip Steel

The volume of business has slackened considerably but there is not much evidence as yet of an improvement in delivery. Mills generally are unable to take orders for shipment before late June or early July. Makers of agricultural implements are crowding mills for shipments. Good specifications are coming from automobile parts plants, but these have considerable strip under contract and are not making additional purchases.

Bars, Plates and Shapes

New demand for hot rolled bars has continued to taper off, and there has been considerable reduction in backlogs. Deliveries have further improved, some of the mills now promising late May shipment on certain sizes. Plates are still fairly active, and deliveries show little, if any, improvement, some of the mills being filled up to capacity for 16 weeks. In the construction field there is a fair amount of private work requiring small lots. Ohio Crankshaft Co., Cleveland, has placed 270 tons for plant extensions with the Burger Iron Co., Akron. The general contract has been awarded for a high school in Toledo requiring 1700 tons.

Iron Ore

Receipts at lower Lake ports during April amounted to 2,599,712 tons, of which 1,829,761 tons was delivered to Lake Erie ports and 769,951 tons to other than Lake Erie ports. Shipments from Lake Erie docks during April were 2,069,829 tons. The ore remaining on Lake Erie Docks May 1 was only 2,336,653 tons, a reduction of 1,793,295 tons as compared with May 1 last year.

Addressograph to
Expand; Cost
\$1,300,000

ADDRESSOGRAPH - MULTIGRAPH CORP., Cleveland, plans to erect plant extensions and to install new equipment involving an expenditure of \$1,300,000. The company will issue \$3,000,000 in new preferred stock from the proceeds of which \$1,700,000 will be used to retire outstanding debentures and the remainder will be used for the plant extensions.



... Awards of 16,415 tons
—2260 tons in new
projects.

AWARDS

Nassau County, N. Y., 100 tons, bridge, Northern State Parkway, to Concrete Steel Co.

Chicago, 6000 tons, three store buildings and warehouse for Goldblatt Stores, to Inland Steel Co.

Chicago, 1000 tons, Wesley Memorial Hospital, to Inland Steel Co.

Chicago, 500 tons, mail order house building, to Inland Steel Co.

Chicago, 500 tons, Moody Bible Institute, to Inland Steel Co.

Riverdale, Ill., 1000 tons, Acme Steel Co., to Joseph T. Ryerson & Son, Inc.

Sioux City, Iowa, 1500 tons, reservoir, to Sheffield Steel Corp. through Construction Products Co.

Waterloo, Iowa, 425 tons, post office, to Inland Steel Co.

Easterville, Iowa, 215 tons, packing plant, to Laclede Steel Co.

St. Louis, 400 tons, Crown Can Co., to Laclede Steel Co.

State of Wisconsin, 150 tons, roadwork, to Concrete Steel Co.

Pomona, Cal., 1600 tons, Bureau of Reclamation project, to Carnegie-Illinois Steel Corp.

Odair, Wash., 1450 tons, Bureau of Reclamation project, to Carnegie-Illinois Steel Corp.

Yakima, Wash., 1572 tons, Roza reclamation project, to Carnegie-Illinois Steel Corp.

NEW REINFORCING BAR PROJECTS

New York, 360 tons, section from West 9th to West 18th Streets, Sixth Avenue subway; bids taken.

Glendale, Long Island, 130 tons, overhead bridge, Long Island Railroad; bids taken.

Buffalo, 500 tons, addition to Eastern States Milling Co.; McDonald Engineering Co. low bidder on general contract.

Cleveland, 300 tons, buildings for George Worthington Co.; H. K. Ferguson Co., Cleveland, contractor.

Rossford, Ohio, 300 tons, Libbey-Owens-Ford Glass Co. power plant.

Cap-au-Gris, Mo., 640 tons, dam; bids May 18.

State of Wisconsin, 225 tons, substructure of bridge No. 300, Mississippi River at La Crosse; bids close May 28.

State of Missouri, 500 tons, highway projects, including 260 tons for St. Louis County, and 110 tons for Buchanan County; bids May 15.

Pocatello, Idaho, 317 tons, overhead crossing; bids May 21.

Casper, Wyo., 118 tons, Casper Alcora project; bids opened.

not to be heat treated, and employment of chrome-nickel electrodes on wing braces, motor mounts and other parts, which were both preheated and post-heated.

Test welds on heat-treated parts showed tensile strengths up to 140,000 lb. per sq. in., and the completed landing gear assembly easily withstood a load test of 25 tons. The photo herewith is by courtesy of the Metal & Thermit Corp., New York, whose Murex heavy-coated electrodes were employed for all of the welding.

Use of Fluxes in Zinc Galvanizing

AT the second meeting of the Galvanizers Committee under the sponsorship of the American Zinc Institute, Inc., at St. Louis, April 26, A. T. Baldwin, of Hanson-Van Winkle-Munning Co. presented a detailed paper on fluxing, which reviewed the action of all well-known materials used by sheet galvanizers, such as hydrochloric acid, sal ammoniac (ammonium chloride), zinc chloride and zinc ammonium chloride. The author was of the general opinion that the use of the hydrochloric acid-sal ammoniac flux is forced on sheet galvanizers as a handy, effective way to overcome pickling and rinsing difficulties. It seems inexpensive, but it is really not, in view of the total cost of producing a really satisfactory product. Mr. Baldwin maintained that there is ample technical and practical evidence at hand to justify the use of a suitable zinc ammonium chloride flux and flux wash to produce a higher grade product economically.

Eaton Mfg. Building Research Laboratory

RESEARCH and engineering laboratory is being erected by the Eaton Mfg. Co. adjacent to its plant on French Road, Detroit. According to C. I. Ochs, president, particular emphasis will be placed upon experimental engineering on valves, valve tappets and valve seat inserts manufactured by Eaton's Wilcox-Rich Division. The building, a two-story modern style structure, will have five dynamometer rooms on the first floor, drafting room, research and experimental laboratories and offices on the second floor. It will be completed in August, with Gottsman-Matthes Co., Detroit, as general contractors.

Arc Welded Transport Plane Completed

EXTENSIVE use of electric arc welding is a feature of the airplane illustrated, the Beechcraft model 18, completed recently by the Beech Aircraft Co., Wichita, Kan. This eight-passenger transport is equipped with two 640-hp. radial engines and is capable of a cruising speed of 195 mi. per hr.

Landing gear, motor mounts, wing braces and a number of fusi-

lage members were weld-fabricated from S.A.E. X-4130 steel airplane tubing of 0.065 in. and greater thickness. Before construction of the plane was started considerable development was necessary. Jigs and fixtures to permit positioning of the work were devised and a welding technique was evolved. The latter involved use of mild steel electrodes in welding the parts which were



1936 Output of Sheets, Strip and Tin Plate

ANNUAL STEEL PRODUCTION (Ingots and Steel for Castings)							
Years	OPEN HEARTH			Bessemer	Crucible	Electric	Total
	Basic	Acid	Total				
1922	28,387,171	921,812	29,308,983	5,919,298	28,606	346,039	35,602,926
1923	34,665,021	1,234,636	35,899,657	8,484,088	44,079	515,872	44,943,696
1924	30,719,523	857,827	31,577,350	5,899,590	22,473	432,526	37,931,939
1925	37,087,342	947,146	38,034,488	6,723,962	19,562	615,512	45,393,524
1926	39,653,315	1,038,664	40,691,979	6,934,568	15,493	651,723	48,235,763
1927	37,144,268	924,067	38,068,335	6,191,727	9,036	666,087	44,935,185
1928	43,200,483	913,473	44,113,956	6,620,195	7,769	802,260	51,544,180
1929	47,232,419	1,120,469	48,352,888	7,122,509	6,645	951,431	56,433,473
1930	34,268,316	780,856	35,049,172	5,035,459	2,253	612,599	40,699,483
1931	22,130,398	379,168	22,509,566	3,023,446	1,547	410,942	25,945,501
1932	11,742,682	164,648	11,907,330	1,532,076	645	241,111	13,681,162
1933	20,057,146	324,526	20,381,672	2,425,791	681	421,203	23,232,347
*1934	23,256,417	274,668	23,531,085	2,162,357	531	361,296	26,055,289
*1935	30,361,237	354,192	30,715,429	2,835,031	642	541,492	34,092,594
*1936	43,114,826	421,302	43,536,128	3,458,457	816	772,455	47,767,856

PRODUCTION OF HOT ROLLED IRON AND STEEL PRODUCTS			
BY YEARS			
Years	Iron	Steel	Total
1922	905,097	25,546,907	26,452,004
1923	955,597	32,321,479	33,277,076
1924	699,476	27,386,959	28,086,435
1925	727,275	32,659,685	33,386,960
1926	676,854	34,819,038	35,495,892
1927	544,344	32,334,687	32,879,031
1928	484,977	37,177,939	37,662,916
1929	475,049	40,594,367	41,069,416
1930	316,053	29,196,954	29,513,007
1931	188,726	18,987,168	19,175,894
1932	98,712	10,352,376	10,451,088
1933	130,653	16,604,433	16,735,086
1934	162,140	18,807,366	18,969,506
1935	134,491	23,830,061	23,964,552
1936	201,869	33,599,510	33,801,379

ANNUAL STEEL ININGOT PRODUCTION							
Years	OPEN HEARTH			Bessemer	Crucible	Electric	Total
	Basic	Acid	Total				
1922	27,961,190	517,045	28,478,235	5,871,565	27,561	191,057	34,568,418
1923	34,093,711	653,337	34,747,048	8,416,576	42,127	279,914	43,485,665
1924	30,263,005	454,926	30,717,931	5,846,153	21,096	225,977	36,811,157
1925	36,632,060	484,843	37,116,903	6,670,128	17,729	335,978	44,140,738
1926	39,172,688	533,285	39,705,973	6,891,502	13,452	325,278	46,936,205
1927	36,750,387	493,653	37,244,040	6,153,703	7,696	371,278	43,776,717
1928	42,818,557	454,883	43,273,440	6,591,745	6,516	453,692	50,335,393
1929	46,644,206	576,393	47,220,599	7,091,680	5,762	532,392	54,850,433
1930	33,896,518	367,181	34,263,699	5,020,588	1,563	307,418	39,595,268
1931	21,986,933	194,388	22,181,321	3,011,394	831	235,376	25,438,922
1932	11,689,495	104,794	11,794,289	1,528,544	241	141,328	13,464,402
1933	19,972,805	195,495	20,168,300	2,425,779	399	299,808	22,894,286
1934	23,235,688	201,073	23,436,761	2,162,357	531	349,095	25,948,744
1935	30,334,442	248,512	30,582,954	2,835,031	642	521,818	33,940,445
1936	43,070,917	278,406	43,349,323	3,458,457	816	704,213	47,512,809

PRODUCTION OF HOT ROLLED IRON AND STEEL PRODUCTS					
BY STATES					
States	1932	1933	1934	1935	1936
Maine, Mass.	110,050	175,506	158,559	198,790	246,916
Rhode Island, Conn.	473,952	646,923	800,338	969,095	1,440,038
New York	51,585	73,199	86,466	94,097	111,047
New Jersey	3,269,548	5,059,366	5,619,410	6,521,515	10,032,035
Pennsylvania	416,754	711,862	788,824	977,361	1,367,012
Delaware, Md., Va.	445,369	779,914	797,039	1,045,051	1,191,403
West Virginia	269,859	366,553	401,305	571,732	658,761
Kentucky, Tenn., Ga., Texas	367,902	567,819	628,409	728,390	1,087,414
Alabama	2,311,419	3,974,493	4,301,239	5,401,948	7,697,296
Ohio	1,126,275	1,984,423	2,446,052	3,276,717	4,431,090
Indiana	737,803	1,150,087	1,311,243	1,890,251	2,510,249
Illinois	456,964	686,760	923,724	1,467,362	1,708,914
Michigan, Wis., Minn.	142,080	149,014	167,112	201,360	315,691
Missouri, Okla.	146,980	166,180	246,999	283,793	534,533
Colorado, Wash.	124,548	242,987	292,787	347,090	468,980
California, Canal Zone					
Total	10,451,088	16,735,086	18,969,506	23,964,552	33,801,379

PRODUCTION OF DUPLEX STEEL					
Years	Gross tons	Years	Gross tons	Years	Gross tons
1922	1,651,089	1927	2,184,674	1932	289,263
1923	2,919,286	1928	2,232,197	1933	386,154
1924	2,131,856	1929	2,961,292	1934	591,373
1925	2,797,318	1930	2,045,277	1935	960,020
1926	2,815,980	1931	945,844	1936	2,099,102

PRODUCTION OF ALLOY STEEL INGOTS AND CASTINGS							
Years	Ingots	Castings	Total	Years	Ingots	Castings	Total
1921	769,293	40,255	809,548	1929	3,764,287	192,920	3,957,207
1922	1,614,392	59,104	1,673,496	1930	2,317,183	126,128	2,443,311
1923	2,014,269	92,220	2,106,489	1931	1,366,010	89,903	1,455,913
1924	1,940,461	85,948	2,026,409	1932	757,560	41,044	798,604
1925	2,320,390	112,583	2,432,973	1933	1,475,400	71,783	1,547,183
1926	2,317,313	146,101	2,463,414	*1934	1,595,544	16,731	1,612,275
1927	2,385,904	145,844	2,531,748	*1935	2,087,427	32,231	2,119,658
1928	3,045,225	169,684	3,214,909	*1936	2,788,100	95,522	2,883,622

PRODUCTION OF ALLOY STEEL INGOTS AND CASTINGS				
BY PROCESSES				
Processes	1933	*1934	*1935	*1936
Open hearth steel—basic	1,169,255	1,278,343	1,633,541	2,239,885
Open hearth steel—acid	57,097	34,540	73,400	115,766
Bessemer steel	24,519	53		
Crucible steel	102	103	154	209
Electric steel	296,210	299,236	412,563	527,762
Total	1,547,183	1,612,275	2,119,658	2,883,622

*The figures for 1934, 1935 and 1936 include only that portion of the steel for castings which was produced in foundries operated by companies producing steel ingots.

PRODUCTION OF HOT ROLLED IRON AND STEEL PRODUCTS	
IN 1936	
	Gross tons
FLAT ROLLED PRODUCTS:	
Plates (sheared and universal)	2,526,741
Sheets	6,995,905
Strip	3,224,916
Hoops	109,279
Cotton ties and baling bands	37,781
Black plate	2,629,671
Total	15,524,293
BARS:	
Merchant	5,062,948
Concrete reinforcement	1,028,563
Total Bars	6,091,511
Structural shapes	
Sheet piling	2,897,631
Rails	117,157
Long splice bars, tie plate bars, etc.	1,219,846
Skelp	471,521
Blanks or pierced billets for seamless tubes	2,156,602
Wire rods	1,615,963
Car wheels (rolled steel)	2,987,880
Cross ties	128,728
Rolled forging blooms, billets and axle blanks	13,700
Blooms, billets, slabs and sheet bars for export	473,199
All other fin. hot rolled products	16,030
Total	77,318
Grand total	12,185,575
	33,801,379

Exceeded That of Record Year 1929

PRODUCTION of steel ingots of all classes in the United States in 1936 was 47,767,856 gross tons, according to statistical bulletin No. 3, released last week by the American Iron and Steel Institute. Detailed figures are given in the accompanying table.

In addition to the figures here reproduced, the institute has issued additional data on various classifications of steel products.

Of the 2,526,741 tons of plates, 1,849,942 tons was sheared and 676,799 tons universal compared with 1,015,983 tons and 439,362 tons, respectively, in 1935.

Sheet and strip production of 10,367,881 tons was divided as follows: Hot rolled, 2,734,760 tons; hot rolled annealed, 4,261,145 tons; strip, 3,-

224,916 tons; hoops, 109,279 tons; cotton ties and baling bands, 37,781 tons. Total sheet and strip output greatly exceeded that of 1935, which was 7,937,717 tons.

Of the black plate total of 2,629,671 tons, 2,283,378 tons was for tinning and 346,293 tons for other uses. Total tin plate and terne plate production was 2,355,561 tons, of which 2,103,153 tons was tin plate—2,081,784 tons of coke and 21,369 tons of charcoal plate.

Production of some products exceeded that of the record-breaking year 1929. Tin and terne plate was a conspicuous example, recording a gain of almost 20 per cent over 1929. Sheet and strip output was more than 24 per cent above that of 1929. Production of skelp and black or

pierced billets for seamless tubes also gained substantially over that of 1929.

On the other hand, some products showed considerably lower total output than in 1929. Bars, plates and shapes had substantial losses when compared with that year. Although total bar output was lower, concrete reinforcing bars were slightly higher.

An interesting trend is to be observed in a comparison of open hearth and bessemer steel ingot production. In 1929 the bessemer steel total was about 12.6 per cent of all ingots produced, whereas in 1936 the bessemer total was only 7.2 per cent. Last year's bessemer steel output was approximately half that of 1929.



...SAN FRANCISCO...

...5500 tons of steel awarded for towers.

...Mill backlogs still large; near capacity operations.

SAN FRANCISCO, May 10.—Last week's activity was marked by the award of 5500 tons of galvanized structural steel for the construction of transmission towers at Seattle to A. S. Schulman Electric Co., Chicago. This company will furnish the steel and erect the towers. Carnegie-Illinois Steel Co. received an award of 1572 tons of reinforcing bars for the Roza reclamation project at Yakima, Wash. Though the market was by no means slow, other awards were small. Structural lettings aggregated 5876 tons and reinforcing awards were 2035 tons.

The Los Angeles Metropolitan Water District will open bids May 17 on 20,000 lin. ft. of 30-in. slip-joint, 10 gage sheet steel water pipe. The Los Angeles Department of Water and Power will open bids also on May 17 on 18,000 lin. ft. of 6-in. water pipe.

At Long Beach, Cal., the Atlas

Scraper & Engineering Co. is low bidder on 700 tons of structural shapes for a city project. Wisconsin Bridge & Iron Co. is low bidder on 290 tons of shapes for the construction of Del Rey Bridge at Los Angeles.



...BOSTON...

...Pig iron buying is in small volume.

BOSTON, May 11.—Pig iron continues to sell in small lots, mostly for prompt shipment and mixture purposes, and there is nothing which suggests any pick-up until buying for the next quarter starts, probably late this month or early next month. The Westinghouse Electric & Mfg. Co., Springfield, Mass., contemplates an addition to its foundry, and several other concerns have new equipment and layouts under consideration.

Cast iron pipe production has been stepped up somewhat because municipalities which previously placed orders are taking deliveries more freely and in larger quantities. Machine tool builders report some let-down in sales. Makers of presses adapted to small work are literally buried with business.

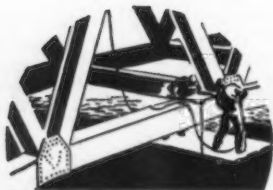


....ST. LOUIS....

... Steel business declines as consumers use up stocks.

ST. LOUIS, May 11.—Business in finished steel is falling off, due to the fact that users are using up their inventories, having previously made heavy commitments in anticipation of price advances. Buying of wire products and galvanized roofing from distributors and dealers continues heavy, and it is expected that this will be reflected in re-ordering from the mills earlier than usual.

The State of Missouri will open bids May 15 for highway projects requiring 500 tons of reinforcing bars and 400 tons of structural shapes. The Key Co. will require 400 tons of structural for a foundry building at East St. Louis, Ill. The Laclede Steel Co. has been awarded 400 tons of reinforcing bars for a factory for the Crown Can Co., 460 tons of structural for this building having been awarded to the Bethlehem Steel Corp. Fabricators of structural steel are reported to be operating at about 50 per cent of capacity, no new business of consequence having been placed here for some time.



FABRICATED STEEL

... Lettings decline to 15,970 tons from 18,850 tons last week.

o o o

... New projects lower at 21,000 tons compared with 52,750 tons a week ago.

o o o

... Plate awards only 316 tons.

NORTH ATLANTIC STATES

New Haven, Conn., 215 tons, boiler house, New Haven Pulp & Board Co., to Berlin Construction Co., Berlin, Conn.

Lee, Mass., 200 tons, paper manufacturing plant, to Haarmann Steel Co., Holyoke, Mass.

Brooklyn, 165 tons, turbine supports for Williamsburgh power plant, to Bethlehem Fabricators, Inc., Bethlehem, Pa.

New York, 180 tons, Board of Water Supply, Contract No. 333, to Jones & Laughlin Steel Corp., Pittsburgh.

New York, 150 tons, Truck Transfer building, West 23rd Street and 11th Avenue, to Alpha Iron Works.

Brooklyn, 230 tons, Fulton Savings Bank building, to Harris Structural Steel Co., Plainfield, N. J.

Brooklyn, 265 tons, bridge, Long Island Railroad, to American Bridge Co.

Brooklyn, 260 tons, public school No. 226, to Ingalls Iron Works Co., Birmingham.

Jefferson County, N. Y., 115 tons, State highway bridge, to R. S. McMannus Steel Construction Co., Buffalo.

Broome County, N. Y., 175 tons, State highway bridge, to Bethlehem Steel Corp.

Newark, N. J., 710 tons, highway bridge, Central Railroad of New Jersey, to American Bridge Co.

Pittsburgh, 260 tons, extension to Reed power station, Duquesne Light Co., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

Pittsburgh, 300 tons, extension to Reed power station, Duquesne Light Co., to Bethlehem Steel Corp.

Harrisburg, Pa., 210 tons, airport hangar, to Bethlehem Steel Corp.

Relay, Md., 155 tons, Maryland Distillery building, to Acme Steel Co.

Baltimore, 165 tons, high school, to Dietrich Brothers, Baltimore.

THE SOUTH

Wytheville, Va., 225 tons, Textile Machine Works building, to Bristol Steel & Iron Works, Bristol, Va.

Zapata County, Tex., 300 tons, bridges, to Virginia Bridge Co., Roanoke, Va.

Beverly, Tex., 195 tons, two power penstocks, to Pittsburgh-Des Moines Steel Co.

Allen, Miss., 200 tons, bridge, to Vincennes Bridge Co., Vincennes, Ind.

CENTRAL STATES

Cleveland, 270 tons, building for Ohio Crankshaft Co., to Burger Iron Co., Akron, Ohio.

Detroit, 1414 tons, third-story addition, Chrysler-De Soto plant, to R. C. Mahon Co., Detroit.

Whiting, Ind., 2300 tons, oil furnace, etc., Standard Oil Co., 1150 tons each to Wisconsin Bridge & Iron Co. and Mississippi Valley Structural Steel Co.

Harrison County, Ind., 125 tons, bridge, to Midland Structural Steel Co., Cicero, Ill.

Riverdale, Ill., 285 tons, Acme Steel Co. buildings, to Joseph T. Ryerson & Son, Inc.

Marseilles, Ill., 225 tons, building addition, to Mississippi Valley Structural Steel Co., St. Louis.

Scranton, N. D., 120 tons, bridge, to Illinois Steel Bridge Co., Jacksonville, Ill.

St. Louis, 210 tons, John Nooler Boiler Works addition, to Superior Structural Steel Co., St. Louis.

Lincoln, Neb., 135 tons, coaling station, to Lakeside Bridge & Iron Co., Milwaukee.

WESTERN STATES

Lincoln County, Colo., 155 tons, bridge, to American Bridge Co.

Las Animas County, Colo., 110 tons, bridge spans, to Midwest Steel & Iron Works Co., Pueblo, Colo.

Banning, Cal., 140 tons, curved tunnel ribs, to Commercial Shearing & Stamping Co.

Los Angeles, 290 tons, Del-Rey electric railway bridge, to Wisconsin Bridge & Iron Co., N. Milwaukee.

Seattle, 5500 tons, transmission towers for Skagit Line, complete job to A. S. Schulman Electric Co., Chicago.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Brooklyn, 600 tons, State court building.

Jamaica, N. Y., 6000 tons, court house.

Glendale, N. Y., 350 tons, highway bridge, Long Island Railroad.

Lockport, N. Y., 2000 tons, additional manufacturing facilities for General Motors Corp.

Buffalo, 175 tons, addition to Buffalo General Hospital.

Erie, Pa., 200 tons, extension for Standard Stoker Co.

Norristown, Pa., 340 tons, brew house, Adam Scheidt Brewing Co.

THE SOUTH

Jacksonville, Fla., 2350 tons, bridge.

Houston, Tex., 2350 tons, Champion Paper & Fibre Co.

CENTRAL STATES

Toledo, Ohio, 1700 tons, high school; J. H. Berkebile & Sons Co., Toledo, contractor.

Harrison County, Ohio, 225 tons, highway bridge.

Cleveland, 100 tons, plant extension for Ferro Enamel Corp.

Dayton, Ohio, 230 tons, office and store building, Talbot Realty Corp.

Rossford, Ohio, 350 tons, Libbey-Owens-Ford Co., extension to boiler house.

Ottawa, Ill., 450 tons, building, Libbey-Owens-Ford Glass Co.

St. Louis, 1100 tons, building, Owens-Illinois Can Co.

St. Louis, 460 tons, armory.

State of Missouri, 400 tons, including 200 tons for St. Louis County, and 105 tons for Buchanan County; bids May 15.

WESTERN STATES

Long Beach, Cal., 700 tons, city project; Atlas Scraper & Engineering Co., low bidder.

Red Bluff, Cal., 550 tons, State bridge over Sacramento River; J. F. Knapp, low bidder on general contract.

FABRICATED PLATES

AWARDS

Hartford, Conn., 316 tons, 90,000-barrel tank for American Oil Co., to Chicago Bridge & Iron Works.

Brockport, N. Y., 165 tons, water tank, to Pittsburgh-Des Moines Steel Co.

SHEET PILING

NEW PROJECTS

Keystone, Neb., 9400 tons, dam; bids May 21.

Canadian Mill Adds Open Hearth

THE Steel Co. of Canada expects to have its 150-ton open-hearth furnace in operation within a few months, according to a Department of Commerce report. Additional wire drawing equipment, machinery for manufacturing steel hoops, and a wire processing furnace have been installed.



...NON-FERROUS...

... *Coronation and English holiday will cause a quiet London market until May 18.*

... *Zinc statistics reveal stocks are becoming dangerously low.*

NEW YORK, May 11.—London activity in all the metals will be slight from today until next Tuesday, May 18, because of the Coronation celebration and the Whitsuntide holidays next

week end. Copper has been quiet all week, some having been sold this morning at 14.32½c. and 14.22½c. in London, and the price holding firm here. Most of the buying is for May, and consumers

show little interest in covering for the months ahead. Nearly all large scrap accumulations are reported to have been cleaned up. The 14.00c. price continues strong.

Lead

Of the metals, lead is perhaps making the best current showing. The fact that customers order only for the present month and subsequent period is considered an important factor in maintaining sales. May is at the moment about 90 per cent covered and June 35 per cent, with no lessening seen in demand. Stocks of all types of lead have declined in the past eight months from 318,000 tons to 213,000 tons, while refined stocks decreased in the same period from 231,000 tons to 137,000. The present rate of stock depletion is from 8000 to 10,000 tons monthly. Prices are steady at 5.85c., St. Louis, and 6.00c., New York.

Zinc

April statistics disclosed a further reduction in stocks of 4640 tons to 13,911 tons, the 26th consecutive monthly decrease since February, 1935. Production last month was 21,281 tons, while shipments amounted to 25,921 tons. This reduction took place in the prime Western grade principally, which was expected to benefit from the resumption of higher operations by the high grade producers, but apparently has not. Buyers had 81,300 tons on order at the end of April, so that the statistics had little effect one way or the other on the trade. Additional producing units are being installed, but full operations may not be expected for some time. Prices are firm at 6.75c., East St. Louis, and 7.10c. New York.

Tin

Practically no demand came out in this market last week, and little is expected before next Tuesday. Prices last week were up and down, but the fluctuations were not so great as in the previous week. Standards in London this morning sold for £247 15s. spot and £246 futures, while the Eastern quotation was £248. United Kingdom warehouse stocks of tin declined 150 tons last week, making a total as of May 8 of 1631 tons.

The Week's Prices. Cents Per Pound for Early Delivery

	May 5	May 6	May 7	May 8	May 10	May 11
Electrolytic copper, Conn.*	14.00	14.00	14.00	14.00	14.00	14.00
Lake copper, N. Y.....	14.62½	14.12½	14.12½	14.12½	14.12½	14.12½
Straits tin, spot, New York	55.50	54.82½	55.25	...	55.25	54.75
Zinc, East St. Louis.....	6.75	6.75	6.75	6.75	6.75	6.75
Zinc, New York.....	7.10	7.10	7.10	7.10	7.10	7.10
Lead, St. Louis.....	5.85	5.85	5.85	5.85	5.85	5.85
Lead, New York.....	6.00	6.00	6.00	6.00	6.00	6.00

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.

†Noon Price.

Aluminum, virgin 99 per cent plus 20.00c.-21.00c. a lb. delivered.

Aluminum No. 12 remelt No. 2 standard, in carloads, 19.00c. to 19.50c. a lb., delivered.

Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.

Antimony, Asiatic, 17.00c. a lb., New York.

Quicksilver, \$91.00 to \$93.00 per flask of 76 lb.

Brass ingots, commercial 85-5-5-5, 14.50c. a lb. delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig.....	56.00c. to 57.00c.
Tin, bar	59.25c. to 60.25c.
Copper, Lake	15.00c. to 16.00c.
Copper, electrolytic.....	15.00c. to 16.00c.
Copper, castings	14.75c. to 15.75c.
*Copper sheets, hot-rolled	21.62½c.
*High brass sheets	19.50c.
*Seamless brass tubes	22.25c.
*Seamless copper tubes	22.37½c.
*Brass rods	16.00c.
Zinc, slabs	8.00c. to 9.00c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	13.75c.
Lead, American pig. 7.00c. to 8.00c.	
Lead, bar	8.00c. to 9.00c.
Lead, sheets, cut. ...	10.50c.
Antimony, Asiatic ...	14.50c.
Alum., virgin, 99 per cent plus	24.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	19.50c. to 21.00c.
Solder, ½ and ½	36.50c. to 38.50c.
Babbitt metal, commercial grade	25.00c. to 65.00c.

*These prices, which are also for delivery from Chicago and Cleveland warehouses, are quoted with 3½ per cent allowed off for extras, except copper tubes and brass rods, on which allowance is 40 per cent

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig.....	59.62½c.
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Tin, bar	61.62½c.
Copper, Lake	15.00c. to 15.25c.
Copper, electrolytic	15.00c. to 15.25c.
Copper, castings	14.75c. to 15.00c.
Zinc, slabs	8.75c. to 9.00c.
Lead, American pig. 6.50c. to 6.75c.	
Lead, bar	10.00c.
Antimony, Asiatic	18.75c.
Babbitt metal, medium grade.....	23.50c.
Babbitt metal, high grade.....	63.62½c.
Solder, ½ and ½	37.75c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	11.00c.	11.75c.
Copper, hvy. and wire	10.37½c.	10.87½c.
Copper, light and bottoms	9.37½c.	9.62½c.
Brass, heavy	6.25c.	6.875c.
Brass, light	5.00c.	5.75c.
Hvy. machine composition	9.37½c.	9.87½c.
No. 1 yel. brass turnings	7.37½c.	7.87½c.
No. 1 red brass or compos. turnings	9.00c.	9.50c.
Lead, heavy	4.75c.	5.12½c.
Cast aluminum	12.12½c.	13.25c.
Sheet aluminum	13.25c.	14.75c.
Zinc	3.75c.	4.12½c.



IRON AND STEEL SCRAP

... No. 1 steel off \$1.50 at Chicago; also 50c. lower at Pittsburgh and Detroit.

o o o

... Composite declines to \$18.75, lowest since Jan. 19.

ALL markets are reported softer. At Pittsburgh where most grades are off 50c. from the previous week, opinion is growing that the downward movement has ended; in Detroit, where prices are marked down a similar amount, it is felt that the downward swing has carried prices to the too-low side and that an adjustment is in order. Heaviest declines took place at Chicago, where a consumer bought No. 1 steel at \$17.50, or \$1.50 under the previous price. Heavy offerings of railroad scrap are adding to the general confusion there. Car wheels are down \$1 to \$2 in several cities, but rose 50c. at Cleveland. Oddly enough, a sale of No. 1 steel by the New York Central at Cleveland was well over the market.

Following a decline of like amount at New York last week, export prices at Boston are down \$1. Heavy shipments are reported to Japan both there and at New York, although the Japanese are temporarily out of the market. Shipments are going forward to the British consumers of the European cartel.

Pittsburgh

Although the market developed a slightly softer tone in the past week, opinion is growing that the downward movement has practically ended. Consumers have been out of the market for quite some time, but they have had company in that many dealers refuse to sell short at present prices. A sale of No. 1 steel was made into consumption last week at \$21 and covering is fairly easy at \$19.50. With present transactions involving only moderate sized tonnages, there has been little chance to test the question uppermost in every one's mind as to the plentifulness of scrap. Consideration of all factors indicates No. 1 steel quotable at \$19.50 to \$20, down 50c. a ton from last week. With a large number of brokers being without orders, distress sales have occurred.

Chicago

A mill purchase of heavy melting steel has been made at \$17.50, a new

low for the current downswing in prices, which is barely five weeks old. Brokers who were not short at the start of the break still find themselves in a long position and with scrap flowing in at the full rate of consumption there is nothing to check the downward skid of quotations. Railroad offerings are heavy and producers in general are selling as fast as they make scrap, all of which adds to the general confusion.

Cleveland

Without support of consumer purchases, the market is weak and there have been further price declines of 50c. a ton on steel making grades, except on heavy melting steel. Youngstown prices are 50c. a ton lower on steel making grades. Mills in this territory are getting heavy water shipments and reduced prices are not tempting them to make new purchases. No. 1 heavy melting steel sold by the New York Central Railroad last week brought \$20.50, most of it going to a Buffalo consumer. Cast iron car wheels have not suffered the slump experienced by other grades, the wheels on the railroad's list bringing \$23, or 50c. higher than a month ago.

Philadelphia

Mainly because of weakness in Pittsburgh and an almost complete absence of mill buying in this district, No. 1 steel is down 50c. a ton this week to \$19 to \$19.50, with numerous other changes being made throughout the list. Most mills report fairly large scrap piles and good-sized tonnages on order. One consumer has held up all scrap shipments for a few weeks in the hope that prices will be depressed even further. The Bethlehem Steel Corp. is said to be obtaining supplies freely at \$18 and \$16.50 delivered Bethlehem, for No. 1 and No. 2 steel respectively. Export buying is not so great as formerly.

Buffalo

The district's largest consumer bought 4000 to 5000 tons of No. 1 and No. 2 heavy melting steel with allied grades at \$18.50 and \$17, respectively. This mill has now reduced its offering price to \$18 and \$16.50 for the two grades. The market seems to be weaker in spite of sustained high operation of open hearths.

Boston

One exporter has withdrawn from the market, temporarily at least, and others have dropped their price on No. 1 heavy melting steel \$1 a ton and on No. 2, 50c. Quotations on other materials are lower generally, but very largely nominal. Exports to Japan continue heavy, no less than 20,000 tons having been shipped there the past fortnight. Scotland, England and Holland also are factors in the export market. Italy is practically out of the picture. The Weirton Steel Co., after withdrawing from the steel turning and skeleton market, is again buying bundled skeleton or busheling, for which brokers are paying \$11.80 a ton on cars, off 50c. a ton.

New York

Consumers have been successful in coaxing out scrap at lower prices and brokers' offerings are again down. Japan is still out of the export market, but large tonnages are being shipped on old orders. At least a half dozen ships are being loaded or have left New York harbor for the British consumers in the European cartel, although rumors have been current that no scrap had been loaded, pending completion of credit arrangements.

St. Louis

Further price declines in scrap iron were reported in the St. Louis market, No. 2 heavy melting being 25c. a ton off. Selected heavy steel, No. 2 railroad wrought and No. 1 railroad cast are 50c. lower, and cast iron car wheels \$1 less, as compared with the preceding week. The only purchases by the mills in the district were of small tonnages of distress No. 2 heavy melting at \$14.75. Railroad lists include: Missouri Pacific, 60 carloads; Kansas City Southern, 400 tons, and St. Louis-San Francisco, 1000 tons.

Cincinnati

Mill interest in new purchases of scrap is nil. Current activity is confined to allocation of material on old orders and absorption into yard supplies of material which is still coming out under the original high price impetus of several weeks ago. Dealers' bids are sliding downward at rapid pace, but the final level is still undetermined.

Detroit

Very cautious buying and selling with no real large quantities involved seems to be the keynote of Detroit's scrap market. Bottom to the price plunge does not seem apparent, but as the downswing continues, the viewpoint is expressed locally that prices are at a reasonable and normal level, but that the pendulum effect has carried them temporarily toward the too-low side. On Friday, Fisher Body will close a list of 177 cars.

Birmingham

The scrap market has slowed up considerably. Demand for steel grades is off and prices have weakened. Cast grades, however, are moving fairly well.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$19.50 to \$20.00
Railroad hvy. mltng.	20.50 to 21.00
No. 2 hvy. mltng. steel.	16.50 to 17.00
No. 2 RR. wrought	19.50 to 20.00
Scrap rails	21.00 to 21.50
Rails 3 ft. and under	25.00 to 25.50
Comp. sheet steel	19.50 to 20.00
Hand bundled sheets	17.00 to 17.50
Hvy. steel axle turn.	18.00 to 18.50
Machine shop turn.	14.50 to 15.00
Short shov. turn.	15.00 to 15.50
Mixed bor. & turn.	14.00 to 14.50
Cast iron borings	14.00 to 14.50
Cast iron carwheels	19.00 to 19.50
Hvy. breakable cast.	16.00 to 16.50
No. 1 cupola cast.	19.50 to 20.00
RR. knuckles & cplrs.	25.25 to 25.75
Rail coil & leaf springs	25.25 to 25.75
Rolled steel wheels	25.25 to 25.75
Low phos. billet crops	25.75 to 26.25
Low phos. sh. bar	24.75 to 25.25
Low phos. punchings	22.75 to 23.25
Low phos. plate, hvy.	24.25 to 24.75
Low phos. plate clip.	22.75 to 23.25
Steel car axles	24.50 to 25.00

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$18.00 to \$18.50
No. 2 hvy. mltng. steel.	17.00 to 17.50
Comp. sheet steel	17.50 to 18.00
Light bund. stampings	13.00 to 13.50
Drop forge flashings	16.50 to 17.00
Machine shov. turn.	12.50 to 13.00
Short shov. turn.	13.50 to 14.00
No. 1 busheling	17.50 to 18.00
Steel axle turnings	14.50 to 15.00
Low phos. billet and bloom crops	24.00 to 24.50
Cast iron borings	13.00 to 13.50
Mixed bor. & turn.	13.00 to 13.50
No. 2 busheling	13.00 to 13.50
No. 1 cast	19.50 to 20.00
Railroad grate bars	12.00 to 12.50
Stove plate	10.00 to 10.50
Rails under 3 ft.	25.00 to 25.50
Rails for rolling	21.50 to 22.00
Railroad malleable	21.00 to 21.50
Cast iron carwheels	22.50 to 23.00

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$19.00 to \$19.50
No. 2 hvy. mltng. steel.	17.00 to 17.50
Hydraulic bund., new	19.00 to 19.50
Hydraulic bund., old	15.50 to 16.00
Steel rails for rolling	21.00 to 21.50
Cast iron carwheels	21.00 to 21.50
Hvy. breakable cast.	18.50 to 19.00
No. 1 cast	21.00 to 21.50
Stove plate (steel wks.)	15.00 to 15.50
Railroad malleable	19.00 to 19.50
Machine shop turn.	14.00
No. 1 blast furnace	13.00
Cast borings	13.00 to 13.50
Heavy axle turnings	17.00 to 17.50
No. 1 low phos. hvy.	25.00 to 25.50
Couplers & knuckles	25.00 to 25.50
Rolled steel wheels	25.00 to 25.50
Steel axles	25.50 to 26.00
Shafting	24.50 to 25.00
No. 1 RR. wrought	19.50 to 20.00
Spec. iron & steel pipe	16.50 to 17.00
No. 1 forge fire	16.50 to 17.00
Cast borings (chem.)	14.00 to 14.50

CHICAGO

Delivered to Chicago district consumers:	
Per Gross Ton	
Hvy. mltng. steel.	\$17.00 to \$17.50
Auto. hvy. mltng. steel	16.00 to 16.50
Alloy free	16.50 to 17.00
Shoveling steel	17.00 to 17.50
Hydraul. comp. sheets	16.50 to 17.00
Drop forge flashings	15.50 to 16.00
No. 1 busheling	16.25 to 16.75
Rolled carwheels	20.50 to 21.00
Railroad tires, cut	21.50 to 22.00
Railroad leaf springs	21.00 to 21.50
Steel coup. & knuckles	20.00 to 20.50
Axle turnings	16.50 to 17.00
Coil springs	22.25 to 22.75
Axle turn. (elec.)	18.50 to 19.00
Low phos. punchings	21.00 to 21.50
Low phos. plates, 12 in. and under	21.00 to 21.50
Cast iron borings	11.00 to 11.50
Short shov. turnings	11.00 to 11.50
Machine shop turn.	9.50 to 10.00
Rerolling rails	21.50 to 22.00
Steel rails under 3 ft.	21.00 to 21.50
Steel rails under 2 ft.	22.50 to 23.00
Angle bars, steel	20.50 to 21.00
Cast iron carwheels	19.50 to 20.00
Railroad malleable	19.50 to 20.00
Agric. malleable	17.00 to 17.50
Iron car axles	24.50 to 25.00

Per Net Ton

Steel car axles	\$22.50 to \$23.00
No. 1 RR. wrought	15.00 to 15.50
No. 2 RR. wrought	15.50 to 16.00
No. 2 busheling, old	8.50 to 9.00
Locomotive tires	18.50 to 19.00
Pipes and flues	13.50 to 14.00
No. 1 machinery cast.	15.00 to 15.50
Clean auto. cast.	14.00 to 14.50
No. 1 railroad cast.	14.00 to 14.50
No. 1 agric. cast.	13.00 to 13.50
Stove plate	12.00 to 12.50
Grate bars	12.50 to 13.00
Brake shoes	12.00 to 12.50

BUFFALO

Per gross ton, f.o.b. consumers' plants:	
No. 1 hvy. mltng. steel.	\$18.00 to \$18.50
No. 2 hvy. mltng. steel.	16.75 to 17.25
Scrap rails	19.00 to 19.50
New hvy. b'ndled sheet	16.75 to 17.25
Old hydraul. bundles	15.75 to 16.25
Drop forge flashings	16.75 to 17.25
No. 1 busheling	16.75 to 17.25
Hvy. axle turnings	13.50 to 14.00
Machine shop turn.	12.00 to 12.50
Knuckles & couplers	21.00 to 21.50
Coil & leaf springs	21.00 to 21.50
Rolled steel wheels	21.00 to 21.50
Low phos. billet crops	21.50 to 22.00
Shov. turnings	13.00 to 13.50
Mixed bor. & turn.	11.00 to 11.50
Cast iron borings	11.00 to 11.50
Steel car axles	20.00 to 20.50
No. 1 machinery cast.	18.50 to 19.00
No. 1 cupola cast.	17.50 to 18.00
Stove plate	14.00 to 14.50
Steel rails under 3 ft.	21.50 to 22.50
Cast iron carwheels	17.00 to 17.50
Railroad malleable	19.50 to 20.00
Chemical borings	12.00 to 12.50

BIRMINGHAM

Per gross ton delivered to consumer:	
Hvy. melting steel	\$15.00 to \$17.00
Scrap steel rails	17.00 to 19.00
Short shov. turnings	9.00 to 10.00
Stove plate	9.00 to 11.00
Steel axles	18.00 to 19.00
Iron axles	16.50 to 18.00
No. 1 RR. wrought	13.00 to 15.00
Rails for rolling	18.00 to 20.00
No. 1 cast	16.00 to 18.00
Tramcar wheels	16.00 to 18.00

ST. LOUIS

Dealer's buying prices per gross ton delivered to consumer:	
Selected hvy. steel	\$17.00 to \$17.50
No. 1 hvy. melting	17.00 to 17.50
No. 2 hvy. melting	14.25 to 14.75
No. 1 locomotive tires	20.00 to 20.50
Misc. stand.-sec. rails	18.00 to 18.50
Railroad springs	21.00 to 21.50
Bundled sheets	11.00 to 11.50
No. 2 RR. wrought	16.50 to 17.00
No. 1 busheling	13.50 to 14.00
Cast bor. & turn.	7.50 to 8.00
Rails for rolling	19.00 to 19.50
Machine shop turn.	9.00 to 9.50
Heavy turnings	14.00 to 14.50
Steel car axles	21.50 to 22.00
Iron car axles	22.00 to 22.25
No. 1 RR. wrought	14.00 to 14.50
Steel rails under 3 ft.	20.00 to 20.50
Steel angle bars	19.25 to 19.75
Cast iron carwheels	20.00 to 20.50
No. 1 machinery cast.	15.00 to 15.50
Railroad malleable	19.50 to 20.00
No. 1 railroad cast.	14.50 to 15.00
Stove plate	12.50 to 13.00
Agricul. malleable	12.50 to 13.00
Grate bars	12.00 to 12.50
Brake shoes	13.50 to 14.00

CINCINNATI

Dealer's buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$15.25 to \$15.75
No. 2 hvy. mltng. steel.	13.25 to 13.75
Scrap rails for mltng.	18.00 to 18.50
Loose sheet clippings	10.50 to 11.00
Bundled sheets	14.50 to 15.00
Cast iron borings	8.00 to 8.50
Machine shop turn.	8.75 to 9.25
No. 1 busheling	13.00 to 13.50
No. 2 busheling	7.25 to 7.75
Rails for rolling	20.50 to 21.00
No. 1 locomotive tires	15.75 to 16.25
Short tails	19.75 to 20.25
Cast iron carwheels	14.75 to 15.25
No. 1 machinery cast.	14.00 to 14.50
No. 1 railroad cast.	14.25 to 14.75
Burnt cast.	10.00 to 10.50
Stove plate	10.00 to 10.50
Agricul. malleable	15.00 to 15.50
Railroad malleable	16.25 to 16.75

DETROIT

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel.	14.00 to 14.50
Borings and turnings	10.50 to 11.00
Long turnings	10.00 to 10.50
Short shov. turnings	11.00 to 11.50
No. 1 machinery cast.	15.50 to 16.00
Automotive cast.	16.00 to 16.50
Hydraul. comp. sheets	16.00 to 16.50
Stove plate	10.00 to 10.50
New factory bushel	14.50 to 15.00
Old No. 2 busheling	10.00 to 10.50
No. 2 busheling (black fender stock)	11.50 to 12.00
Sheet clippings	11.00 to 11.50
Flashings	14.50 to 15.00
Low phos. plate scrap	16.50 to 17.00

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. mltng. steel.	\$19.50 to \$20.00
Hydraulic bundles	19.00 to 19.50
Machine shop turn.	14.00

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$15.00 to \$15.50
No. 2 hvy. mltng. steel.	14.00 to 14.50
Hvy. breakable cast.	13.75 to 14.25
No. 1 machinery cast.	15.00 to 15.50
No. 2 cast	14.00 to 14.50
Stove plate	11.00 to 11.50
Steel car axles	25.00 to 26.00
Shafting	19.50 to 20.00
No. 1 RR. wrought	17.00 to 17.50
No. 1 wrought long	16.00 to 16.50
Spec. iron & steel pipe	13.50 to 14.00
Rails for rolling	18.50 to 19.00
Clean steel turnings	9.00 to 9.50
Cast borings	9.50 to 10.00
No. 1 blast furnace	9.50 to 10.00
Cast borings (chem.)	12.00 to 12.50
Unprepar. yard scrap	9.00 to 9.50
Per gross ton, delivered local foundries:	
No. 1 machn. cast.	\$17.50 to \$18.00
No. 1 hvy. cast cupola	15.00 to 15.50
No. 2 cast	14.50 to 15.00

BOSTON

Dealers' buying prices per gross ton:	
No. 1 hvy. mltng. steel.	\$15.30 to \$15.80
Scrap rails	15.30 to 15.80
No. 2 steel	14.25 to 14.75
Breakable cast.	14.25 to 15.00
Machine shop turn.	9.30
Mixed bor. & turn.	7.80 to 9.20
Rund. skeleton long	11.80
Shafting	19.00 to 19.50
Cast bor. chemical	9.50 to 10.25
Per gross ton delivered consumers' yards:	
Textile cast	\$17.00 to \$19.00
No. 1 machine cast.	18.00 to 19.00
Stove plate	10.00 to 10.50

CANADA

Dealers' buying prices at their yards, per gross ton	
Toronto Montreal	
No. 1 hvy. mltng. stl.	\$13.50 \$13.00
No. 2 hvy. mltng. stl.	12.50 12.00
Mixed dealers steel	12.00 11.75
Scrap pipe	19.25 9.75
Steel turnings	9.00 8.50
Cast borings	9.75 9.50
Machinery cast	17.50 17.00
Dealers cast	15.50 15.00
Stove plate	13.00 12.75

EXPORT

Dealers' buying prices per gross ton:	
New York, truck lots, delivered, barges.	
No. 1 hvy. mltng. steel.	\$16.00
No. 2 hvy. mltng. steel.	15.00
No. 2 cast	14.00
Stove plate	\$11.00 to \$11.50
Boston on cars at Army Base or Mystic Wharf	
No. 1 hvy. mltng. steel.	\$17.00
No. 2 hvy. mltng. steel.	16.00
Rails (scrap)	17.00
No. 2 cast	\$14.25 to 14.50
Philadelphia, delivered alongside boats, Port Richmond	
No. 1 hvy. mltng. steel.	\$19.00
No. 2 hvy. mltng. steel.	18.00
New Orleans, f.a.s., Stuyvesant Dock	
No. 1 hvy. mltng. steel.	\$17.50
No. 2 hvy. mltng. steel.	16.50
Los Angeles, on cars or trucks at local piers	
No. 1 hvy. mltng. steel.	\$10.50 to \$11.00
Compressed bundles	8.50 to 9.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham. Prices at Duluth are \$2 a ton higher, and delivered Detroit \$3 higher.

Per Gross Ton
 Rerolling \$37.00
 Forging quality 43.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton
 Open-hearth or Bessemer \$37.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.
 Grooved, universal and sheared 2.10c.

Wire Rods

(No. 5 to 9/32 in.)

Per Gross Ton
 F.o.b. Pittsburgh or Cleveland \$47.00
 F.o.b. Chicago, Youngstown or Anderson, Ind. 48.00
 F.o.b. Worcester, Mass. 49.00
 F.o.b. Birmingham 50.00
 F.o.b. San Francisco 56.00
 F.o.b. Galveston 53.00
 Rods over 9/32 in. to 47/64 in., inclusive, \$5 a ton over base.

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel

Base per Lb.
 F.o.b. Pittsburgh 2.45c.
 F.o.b. Chicago or Gary 2.50c.
 F.o.b. Duluth 2.60c.
 Del'd Detroit 2.60c.
 F.o.b. Cleveland 2.50c.
 F.o.b. Buffalo 2.55c.
 Del'd Philadelphia 2.74c.
 Del'd New York 2.78c.
 F.o.b. Birmingham 2.60c.
 F.o.b. cars dock Gulf ports 2.85c.
 F.o.b. cars dock Pacific ports 3.00c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh 2.30c.
 F.o.b. Cleveland, Chicago, Gary or Moline, Ill. 2.35c.
 F.o.b. Buffalo 2.40c.
 F.o.b. Birmingham 2.45c.
 F.o.b. cars dock Gulf ports 2.70c.
 F.o.b. cars dock Pacific ports 2.85c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.55c.
 F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.60c.
 Del'd Detroit 2.70c.
 F.o.b. cars dock Gulf ports 2.95c.
 F.o.b. cars dock Pacific ports 2.95c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh 2.40c.
 F.o.b. Buffalo, Cleveland, Youngstown, Chicago, Gary or Birmingham 2.45c.
 F.o.b. cars dock Gulf ports 2.80c.
 F.o.b. cars dock Pacific ports 2.80c.

Iron

F.o.b. Chicago 2.40c.
 F.o.b. Pittsburgh (refined) 3.60c.

Cold Finished Bars and Shafting*

Base per Lb.
 F.o.b. Pittsburgh 2.90c.
 F.o.b. Cleveland, Chicago and Gary 2.95c.
 F.o.b. Buffalo 3.00c.
 F.o.b. Detroit 2.95c.

* In quantities of 10,000 to 19,999 lb.

Plates

Base per Lb.
 F.o.b. Pittsburgh 2.25c.
 F.o.b. Chicago or Gary 2.30c.
 Del'd Cleveland 2.435c.
 F.o.b. Coatesville or Spar. Pt. 2.35c.
 Del'd Philadelphia 2.435c.
 Del'd New York 2.53c.
 F.o.b. Birmingham 2.40c.

F.o.b. cars dock Gulf ports 2.65c.
 F.o.b. cars dock Pacific ports 2.80c.
 Wrought iron plates, f.o.b. Pittsburgh 3.80c.

Floor Plates

F.o.b. Pittsburgh 3.80c.
 F.o.b. Chicago 3.85c.
 F.o.b. Coatesville 3.90c.
 F.o.b. cars dock Gulf ports 4.20c.
 F.o.b. cars dock Pacific ports 4.35c.

Structural Shapes

Base per Lb.
 F.o.b. Pittsburgh 2.25c.
 F.o.b. Chicago 2.30c.
 Del'd Cleveland 2.435c.
 F.o.b. Buffalo or Bethlehem 2.35c.
 Del'd Philadelphia 2.455c.
 Del'd New York 2.5025c.
 F.o.b. Birmingham (standard) 2.40c.
 F.o.b. cars dock Gulf ports 2.65c.
 F.o.b. cars dock Pacific ports 2.80c.

Steel Sheet Piling

Base per Lb.
 F.o.b. Pittsburgh 2.60c.
 F.o.b. Chicago or Buffalo 2.70c.
 F.o.b. cars dock Gulf or Pacific Coast ports 3.05c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton \$42.50
 Angle bars, per 100 lb. 2.80

F.o.b. Basing Points

Light rails (from billets) per gross ton \$43.00
 Light rails (from rail steel) per gross ton 42.00

Base per Lb.

Spikes 3.15c.
 Tie plates, steel 2.30c.
 Tie plates, Pacific Coast ports 2.40c.
 Track bolts, to steam railroads. 4.35c.
 Track bolts, to jobbers, all sizes (per 100 counts) 65-5 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS, STRIP, TIN PLATE

TERNE PLATE

Sheets

Hot Rolled

Base per Lb.
 No. 10, f.o.b. Pittsburgh 2.40c.
 No. 10, f.o.b. Gary 2.50c.
 No. 10, del'd Detroit 2.60c.
 No. 10, del'd Philadelphia 2.69c.
 No. 10, f.o.b. Granite City 2.60c.
 No. 10, f.o.b. Birmingham 2.55c.
 No. 10, f.o.b. cars dock Pacific ports 2.95c.
 No. 10 wrought iron, Pgh. 4.25c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh 3.15c.
 No. 24, f.o.b. Gary 3.25c.
 No. 24, del'd Detroit 3.35c.
 No. 24, del'd Philadelphia 3.44c.
 No. 24, f.o.b. Granite City 3.35c.
 No. 24, f.o.b. Birmingham 3.30c.
 No. 24, f.o.b. cars dock Pacific ports 3.80c.
 No. 24, wrought iron, Pittsburgh 5.15c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh. 3.10c.
 No. 10 gage, f.o.b. Gary 3.20c.
 No. 10 gage, f.o.b. Detroit 3.30c.
 No. 10 gage, del'd Philadelphia. 3.39c.
 No. 10, f.o.b. Granite City 3.39c.
 No. 10 gage, f.o.b. Birmingham. 3.25c.
 No. 10 gage, f.o.b. cars dock Pacific ports 3.70c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh. 3.55c.
 No. 20 gage, f.o.b. Gary 3.65c.
 No. 20 gage, del'd Detroit 3.75c.
 No. 20 gage, del'd Philadelphia. 3.84c.
 No. 20, f.o.b. Granite City 3.75c.
 No. 20 gage, f.o.b. Birmingham 3.70c.
 No. 20 gage, f.o.b. cars, dock, Pacific ports 4.10c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh. 3.80c.
 No. 24, f.o.b. Gary 3.90c.
 No. 24, del'd Philadelphia 4.09c.
 No. 24, f.o.b. Granite City 4.00c.

No. 24, f.o.b. Birmingham 3.95c.
 No. 24, f.o.b. cars, dock, Pacific ports 4.40c.
 No. 24, wrought iron, Pittsburgh 6.10c.

Electrical Sheets

(F.o.b. Pittsburgh)

Base per Lb.
 Field grade 3.35c.
 Armature 3.70c.
 Electrical 4.20c.
 Special Motor 5.10c.
 Special Dynamo 5.80c.
 Transformer 6.30c.
 Transformer Special 7.30c.
 Transformer Extra Special 7.80c.

Base gage changed from 28 to 24 gage. Gage extras are the same as those applying on hot-rolled, annealed sheets with few exceptions.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh 4.10c.
 F.o.b. Gary 4.20c.
 F.o.b. cars, dock, Pacific ports 4.80c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh 3.50c.
 No. 20, f.o.b. Gary 3.60c.
 No. 20, f.o.b. Granite City 3.70c.
 No. 20, f.o.b. cars dock Pacific ports 4.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh, per lb. 3.30c.
 No. 28, Gary 3.40c.
 No. 28, f.o.b. Granite City 3.50c.
 No. 28, cars dock Pacific ports, boxed 4.175c.

Tin Plate

Base per Box
 Standard cokes, f.o.b. Pittsburgh district mill \$5.35
 Standard cokes, f.o.b. Gary 5.45
 Standard coke, f.o.b. Granite City 5.55

Above quotations practically the equivalent of previous quotations owing to new method of quoting, effective Jan. 1, 1937.

Special Coated Manufacturing Ternes

Base per Box
 F.o.b. Pittsburgh \$4.65
 F.o.b. Gary 4.75
 F.o.b. Granite City 4.85

* Customary 7½ per cent discount in effect through 1936 discontinued as of Jan. 1, 1937.

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 112 sheets, 20 x 28 in.)
 8-lb. coating I.C. \$11.00
 15-lb. coating I.C. 13.00
 20-lb. coating I.C. 14.00
 25-lb. coating I.C. 15.00
 30-lb. coating I.C. 16.25
 40-lb. coating I.C. 18.50

Hot-Holed Hoops, Bands, Strip and Flats under ¼ in.

Base per Lb.
 All widths up to 24 in., Pittsburgh 2.40c.
 All widths up to 24 in., Chicago 2.50c.
 All widths up to 24 in., del'd Detroit 2.60c.
 All widths up to 24 in., Granite City 2.60c.
 All widths up to 24 in., Birmingham 2.55c.
 Cooperage stock, Pittsburgh... 2.50c.
 Cooperage stock, Chicago 2.60c.

Cold-Rolled Strip*

Base per Lb.
 F.o.b. Pittsburgh 3.20c.
 F.o.b. Cleveland 3.20c.
 Del'd Chicago 3.48c.
 F.o.b. Worcester 3.40c.

* Carbon 0.25 and less.

Cold Rolled Spring Steel

Pittsburgh and Cleveland Worcester
 Carbon 0.25-0.50% 3.20c. 3.40c.
 Carbon .51-.75 4.45c. 4.65c.
 Carbon .76-1.00 6.30c. 6.50c.
 Carbon Over 1.00 8.50c. 8.70c.

Fender Stock

No. 14, Pittsburgh or Cleveland 3.45c.
 No. 20, Pittsburgh or Cleveland. 3.85c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade

	Per Lb.
Bright wire	2.90c.
Spring wire	3.50c.
Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Birmingham \$3 above, and Pacific Coast prices \$9 a ton above Pittsburgh or Cleveland.	

To the Trade

	Base per Keg
Standard wire nails	\$2.75
Smooth coated nails	\$2.75
Cut nails, carloads	\$3.60

Base per 100 Lb.

Annealed fence wire	\$3.20
Galvanized fence wire	3.60
Polished staples	3.45
Galvanized staples	3.70
Barbed wire, galvanized	3.40
Twisted barbed wire	3.40
Woven wire fence, base column. 74	
Single loop bale ties, base col....	63

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., mill prices are \$2 a ton over Pittsburgh, except for woven wire fence, which is \$3 over Pittsburgh and Birmingham mill prices are 3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire, prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills
F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

In.	Steel Black Galv.	In.	Wrought Iron Black Galv.
1/2	52 31	1/2	52 31
3/4	55 38 1/2	3/4	55 38 1/2
1	59 49	1	59 49
1 1/4	62 53	1 1/4	62 53
1 1/2	64 55	1 1/2	64 55

Lap Weld

2	57 47 1/2	2	57 47 1/2
2 1/2	60 50 1/2	2 1/2	60 50 1/2
3	62 52 1/2	3	62 52 1/2
3 1/2	65 55 1/2	3 1/2	65 55 1/2
4	68 58 1/2	4	68 58 1/2
5	71 61 1/2	5	71 61 1/2
6	74 64 1/2	6	74 64 1/2
8	78 68 1/2	8	78 68 1/2
10	82 72 1/2	10	82 72 1/2
12	86 76 1/2	12	86 76 1/2

Butt Weld, extra strong, plain ends	1/2 in. and smaller	3/4 in. and larger
1/2	50 36 1/2	50 36 1/2
3/4	52 38 1/2	52 38 1/2
1	54 40 1/2	54 40 1/2
1 1/4	57 43 1/2	57 43 1/2
1 1/2	59 45 1/2	59 45 1/2
2	61 47 1/2	61 47 1/2
3	64 50 1/2	64 50 1/2
4	67 53 1/2	67 53 1/2
5	70 56 1/2	70 56 1/2
6	73 59 1/2	73 59 1/2
8	77 63 1/2	77 63 1/2
10	81 67 1/2	81 67 1/2
12	85 71 1/2	85 71 1/2

Lap Weld, extra strong, plain ends	2 in. and smaller	2 1/2 in. and larger
2	55 46 1/2	55 46 1/2
2 1/2	58 49 1/2	58 49 1/2
3	61 52 1/2	61 52 1/2
3 1/2	64 55 1/2	64 55 1/2
4	67 58 1/2	67 58 1/2
5	70 61 1/2	70 61 1/2
6	73 64 1/2	73 64 1/2
8	77 68 1/2	77 68 1/2
10	81 72 1/2	81 72 1/2
12	85 76 1/2	85 76 1/2

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G. \$ 9.46	\$ 8.41
1 1/4 in. o.d.	13 B.W.G. 11.21	9.96
1 1/2 in. o.d.	13 B.W.G. 12.38	11.00
1 3/4 in. o.d.	13 B.W.G. 14.09	12.51
2 in. o.d.	13 B.W.G. 15.78	14.02
2 1/4 in. o.d.	13 B.W.G. 17.60	15.63
2 1/2 in. o.d.	12 B.W.G. 19.37	17.31
2 3/4 in. o.d.	12 B.W.G. 21.22	18.85
3 in. o.d.	12 B.W.G. 22.49	19.98
3 1/4 in. o.d.	12 B.W.G. 23.60	20.97
3 1/2 in. o.d.	10 B.W.G. 45.19	40.15
3 3/4 in. o.d.	11 B.W.G. 29.79	26.47
4 in. o.d.	10 B.W.G. 36.96	32.83
5 in. o.d.	9 B.W.G. 56.71	50.38
6 in. o.d.	7 B.W.G. 87.07	77.35

Extra for less-carload quantities:
25,000 lb. or ft. to 39,999 lb. or ft. 5 %
12,000 lb. or ft. to 24,999 lb. or ft. 12 1/2 %
6,000 lb. or ft. to 11,999 lb. or ft. 25 %
2,000 lb. or ft. to 5,999 lb. or ft. 35 %
Under 2,000 lb. or ft. 50 %

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	\$55.00
6-in. and larger, del'd New York	53.00
*6-in. and larger, Birmingham	47.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	56.00
F.o.b. dock, Seattle	56.00
4-in., f.o.b. dock, San Francisco or Los Angeles	59.00
F.o.b. dock, Seattle	59.00

Class "A" and gas pipe, \$3 extra.
4-in. pipe is \$3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is \$41, Birmingham, and \$49.50, delivered Chicago; and 4-in. pipe, \$44, Birmingham, and \$2.40 a ton, delivered Chicago.

BOLTS, NUTS, RIVES, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:	
1/2 in. x 6 in. and smaller	65 and 5*
Larger and longer up to	
1 in.	60 and 10*
1 1/4 in. and larger	60 and 5*
Lag bolts	60 and 10*
Plow bolts, Nos. 1, 2, 3 and 7	65 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex, blank or tapped:	
1/2 in. and smaller	65 and 5*
9/16 in. to 1 in. inclusive	60 and 10*
1 1/4 in. and larger	60 and 5*

Jobbers discount on above items, 5 per cent.

* Less carload lots and less than full container quality. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

Semi-finished hexagon nuts, U.S.S. and S.A.E.

1/2 in. and smaller	60 and 20
9/16 in. to 1 in. inclusive	60 and 15
1 1/4 in. and larger	60 and 12 1/2
Stove bolts in packages, nuts attached	72 1/2
Stove bolts in packages, with nuts separate	72 1/2 and 5
Stove bolts in bulk	81 1/2

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(1/2-in. and larger)

Base per 100 Lbs.

F.o.b. Pittsburgh or Cleveland .. \$3.60
F.o.b. Chicago or Birmingham .. 3.70

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh	70
F.o.b. Cleveland	70
F.o.b. Chicago and Birmingham ..	70

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lb. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller	50 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller	75
Milled headless set screws, cut thread 1/4 in. and smaller	75
Upset hex. head cap screws U.S.S. or S.A.E. thread, 1 in. and smaller	60
Upset set screws, cup and oval points	75
Milled studs	65

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, \$60 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base \$3.00c.
Delivered, Detroit \$3.15c.

S.A.E. Series	Alloy Differential
Numbers	per 100 lb.
200 (1/2% Nickel)	\$0.35
2100 (1 1/4% Nickel)	0.75
2300 (3/4% Nickel)	1.55

2500 (5% Nickel)	\$2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.35
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum) ..	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum) ..	0.75
4600 Nickel-molybdenum (0.20 to 0.30 Mo, 1.50 to 2.00 Ni.) ..	1.10
5100 Chrome steel (0.60-0.90 Cr.) ..	0.35
5100 Chrome steel (0.80-1.10 Cr.) ..	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel-vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, \$60c. base per lb. Delivered Detroit, 3.75c., cartots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	25c.	27c.
Structural shapes	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip ..	23.50c.	21.50c.
Cold-rolled strip ..	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars ..	18.50c.	19c.	22.50c.	27.50c.
Plates ..	21.50c.	22c.	25.50c.	30.50c.
Sheets ..	26.50c.	29c.	32.50c.	36.50c.
Hot strip ..	17c.	17.50c.	23c.	23c.
Cold stp. ..	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c a lb. higher.

British and Continental BRITISH

Per Gross Ton

f.o.b. United Kingdom Ports

Ferromanganese, export	£20 Nominal
Tin plate, per base box	24s. to 25s.
Steel bars, open-hearth	£11
Beams, open-hearth	£9 2s. 6d.
Channels, open-hearth	£10 12s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage	£15
Galvanized sheets, No. 24 gage	£18 15s.

CONTINENTAL

Per Metric Ton, Gold £, f.o.b. Continental Ports

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then converting at present rate of dollar-france exchange.

Billets, Thomas	£3 7s.
Wire rods, No. 5 B.W.G.	£4 10s.
Steel bars, merchant	£5
Sheet bars	£3 8s.
Plate 1/4 in. and up	£6 7s.
Plate 3/16 in. and 5 mm.	£6 13s.
Sheet, 1/4 in.	£7 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£6

IRON AND STEEL WAREHOUSE PRICES

PITTSBURGH*

	Per Net Ton
Plates	3.70c.
Structural shapes	3.70c.
Soft steel bars and small shapes	3.80c.
Reinforcing steel bars	3.80c.
Cold-finished and screw stock:	
Rounds and hexagons	4.15c.
Squares and flats	4.15c.
Hot rolled strip incl. 3/16 in. thick, under 24 in. wide	4.00c.
Hoops	4.50c.
Hot-rolled annealed sheets (No. 24), 10 or more bundles	4.50c.
Galv. sheets (No. 24), 10 or more bundles	5.15c.
Hot-rolled sheets (No. 10)	3.75c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	\$4.48
Spikes, large	1 to 24 kegs 3.90c.
Per Cent Off List	
Track bolts, all sizes, per 100 count	55
Machine bolts, 100 count	55
Carriage bolts, 100 count	55
Nuts, all styles, 100 count	55
Large rivets, base per 100 lb.	\$4.35
Wire, black, soft ann'd, base per 100 lb.	3.45c.
Wire, galv. soft, base per 100 lb.	3.85c.
Common wire nails, per keg	3.00c.
Cement coated nails, per keg	3.00c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lb.

*Delivered in Pittsburgh switching district.

**Prices on application.

CHICAGO Base per Lb.

Plates and structural shapes	3.75c.
Soft steel bars, rounds	3.85c.
Soft steel bars, squares and hexagons	4.00c.
Cold-fin. steel bars:	
Rounds and hexagons	4.30c.
Flats and squares	4.30c.
Hot-rolled strip	4.10c.
Hot-rolled annealed sheets (No. 24)	4.60c.
Galv. sheets (No. 24)	5.25c.
Spikes (keg lots)	4.40c.
Track bolts (keg lots)	5.60c.
Rivets, structural (keg lots)	4.60c.
Rivets, boiler (keg lots)	4.70c.
Per Cent Off List	
Machine bolts	60
Carriage bolts	60
Lag screws	55 and 5
Hot-pressed nuts, sq. tap or blank	60
Hot-pressed nuts, hex. tap or blank	60
Hex. head cap screws	60
Cut point set screws	75
Flat head bright wood screws	62 and 20
Spring cotters	45
Stove bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	55
Wrought washers	\$4.00 off list
Black ann'd wire per 100 lb. to mfg. trade (No. 14 and heavier)	\$4.55
Com. wire nails, 15 kegs or more, per keg	\$3.20
Cement c'd nails, 15 kegs or more, per keg	\$3.20

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 60 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

NEW YORK

	Base per Lb.
Plates, 1/4 in. and heavier	4.60c.
Structural shapes	3.97c.
Soft steel bars, round	4.12c.
Iron bars, Swed. charcoal	6.50 to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	4.57c.
Flats and squares	4.57c.
Cold-rolled: strip, soft and quarter hard	3.92c.
Hoops	4.32c.

Bands	4.32c.
Hot-rolled sheets (No. 10)	4.00 to 4.07c.
Hot-rolled ann'd sheets (No. 24*)	4.50 to 4.82c.
Galvanized sheets (No. 24*)	5.00 to 5.72c.
Long terme sheets (No. 24)	5.50 to 6.20c.
Armco iron, galv. (No. 24†)	6.25c.
Toncan iron, galv. (No. 24†)	6.25c.
Galvanneal (No. 24†)	6.60c.
Armco iron, hot-rolled annealed (No. 24†)	5.65c.
Toncan iron, hot-rolled annealed (No. 24†)	5.65c.
Armco iron hot-rolled (No. 10†)	4.60c.
Toncan iron, hot-rolled (No. 10†)	4.60c.
Cold-rolled sheets (No. 20) less than 1000 lbs.	
Standard quality	5.40c.
Deep drawing	6.05c.
Stretcher leveled	6.05c.
SAE, 2300, hot-rolled	7.82c.
SAE, 3100, hot-rolled	6.37c.
SAE, 6100, hot-rolled, annealed	10.52c.
SAE, 2300, cold-rolled	9.00c.
SAE, 3100, cold-rolled, annealed	8.55c.
Floor plate, 1/4 in. and heavier	5.90c.
Standard tool steel	12.50c.
Wire, black, annealed (No. 9)	4.35c.
Wire, galv. (No. 9)	4.60c.
Tire steel, 1 x 1/2 in. and larger	4.11c.
Open-hearth spring steel	4.75c. to 10.25c.
Common wire nails, base per keg	\$3.40

Per Cent Off List

Machine bolts, square head and nut:	
All diameters. Prices on application	
Carriage bolts, cut thread:	
All diameters. Prices on application	

*No. 28 and lighter, 36 in. wide. 20c. higher per 100 lb.
†125 lb. and more.

ST. LOUIS Base per Lb.

Plates and struc. shapes	3.99c.
Bars, soft steel (rounds and flats)	4.09c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	4.24c.
Cold-fin. rounds, shafting, screw stock	4.54c.
Hot-rolled annealed sheets (No. 24)	4.84c.
Galv. sheets (No. 24*)	5.49c.
Hot-rolled sheets (No. 10)	4.09c.
Black corrug. sheets (No. 24*)	4.89c.
2 galv. corrug. sheets	5.34c.
Structural rivets	4.91c.
Boiler rivets	5.04c.

Per Cent Off List

Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts; all quantities	65

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base Per Lb.
*Plates, 1/4-in. and heavier	3.80c.
*Structural shapes	3.80c.
*Soft steel bars, small shapes, iron bars (except bands)	3.90c.
†Reinforc. steel bars, sq. twisted and deformed	3.21c.
Cold-finished steel bars	4.53c.
*Steel hoops	4.25c.
*Steel bands, No. 12 and 3/16 in. incl.	4.00c.
Spring steel	5.40c.
†Hot-rolled anneal. sheets (No. 24)	4.65c.
†Galvanized sheets (No. 24)	5.30c.
*Hot-rolled annealed sheets (No. 10)	3.90c.
Diam. pat. floor plates, 1/4 in.	5.45c.

These prices are subject to quantity differential except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 25 bundles or over.

†For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.86c.

Soft steel bars	3.75c.
†Reinforc. steel bars	2.60c.
†Cold-finished steel bars	4.30c.
Hot-rolled strip, 6 in. wide and under	4.16c.
Cold-finished strip	3.60c.
Hot-rolled annealed sheets (No. 24)	4.66c.
Galvanized sheets (No. 24)	5.31c.
Hot-rolled sheets (No. 10)	3.91c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.91c.
Floor plates, 3/16 in. and heavier	5.76c.
*Black ann'd wire, per 100 lb.	\$3.40
*No. 9 galv. wire, per 100 lb.	3.80
*Com. wire nails, base per keg	2.95

Per Cent Off List

Machine and carriage bolts, small	65 and 5
Large	60 and 10
Nuts, 100 count	
1/2 in. and smaller	65 and 5
3/16 in. to 1 in.	60 and 10

†Outside delivery 10c. less.

*For 5000 lb. or less.

†Plus switching and cartage charges and quantity differentials up to 50c.

CINCINNATI Base per Lb.

Plates and struc. shapes	3.95c.
Floor plates	5.85c.
Bars, rounds, flats and angles	4.05c.
Other shapes	4.20c.
Rail steel reinforc. bars	3.75c.
Hoops and bands, 3/16 in. and lighter	4.25c.
Cold-finished bars	4.50c.
Hot-rolled annealed sheets (No. 24) 3500 lb. or more	4.60c.
Galv. sheets (No. 24) 3500 lb. or more	\$5.25
Hot-rolled sheets (No. 10)	4.00c.
Small rivets	55 per cent off list
No. 9 ann'd wire, per 100 lb. (1000 lb. or over)	\$2.88
Com. wire nails, base per keg: Any quantity less than carload	3.04
Cement c'd nails, base 100-lb. keg	3.50
Chain. lin. per 100 lb.	8.35
Net per 100 Ft.	
Seamless steel boiler tubes, 2-in.	\$21.80
4-in.	52.45
Lap-welded steel boiler tubes, 2-in.	20.73
4-in.	48.41

BUFFALO Base per Lb.

Plates	3.92c.
Struc. shapes	3.80c.
Soft steel bars	3.90c.
Reinforcing bars	3.10c.
Cold-fin. flats and sq.	4.35c.
Rounds and hex.	4.35c.
Cold-rolled strip steel	3.79c.
Hot-rolled annealed sheets (No. 24)	4.80c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.97c.
Galv. sheet (No. 24)	5.45c.
Bands	4.22c.
Hoops	4.22c.
Heavy hot-rolled sheets	3.97c.
Com. wire nails, base per keg. (2500-lb lots or under)	\$3.26
Black wire, base per 100 lb. (Over 2500 lb.)	4.55c.

BOSTON Base per Lb.

Channels, angles	4.20c.
Tees and zeos, under 3"	4.45c.
H beams and shapes	4.07c.
Plates — Sheared, tank and univ. mill, 1/4 thick and heavier	4.08c.
Floor plates, diamond pattern	6.03c.
Bar and bar shapes (mild steel)	4.20c.
Bands 3/16 in. thick and No. 12 ga. incl.	4.40 to 5.40
Half rounds, half ovals, ovals and bevels	5.45c.
Tire steel	5.45c.
Cold-rolled strip steel	3.845c.
Cold-finished rounds, squares and hexagons	4.65c.
Cold-finished flats	4.65c.
Blue annealed sheets, No. 10 ga.	3.90c.
One pass cold-rolled sheets No. 24 ga.	4.50c.
Galvanized steel sheets, No. 24 ga.	5.05c.
Lead coated sheets, No. 24 ga.	6.15c.

Price delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

Base per Lb.

Soft steel bars	3.94c.
Structural shapes	3.95c.
Plates	3.95c.
Floor plates	5.85c.
Hot-rolled annealed sheets	
(No. 24)*	4.69c.
Hot-rolled sheets (No. 10)	3.94c.
Galvanized sheets (No. 24)*	5.40c.
Bands and hoops	4.19c.
Cold-finished bars	4.30c.
Cold-rolled strip	3.78c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	6.44c.
Quantity differential on bars, plates, structural shapes, bands, hoops, floor plates and heavy hot-rolled: Under 100 lb., 1.50c. over base; 100 to 399 lb., base plus .50c.; 400 to 3999 lb. base; 4000 to 9999 lb., base less .10c.; 10,000 lb. and over, less .15c.	

* Under 400 lb., .50c. over base; 400 to 1499 lb., base; 1500 to 3499 lb., base less .10c.; 3500 lb. and over, base less .15c.

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials covering shipment at one time.

Galvanized and hot-rolled annealed may not be combined to obtain quantity deductions.

MILWAUKEE

Base per Lb.

Plates and structural shapes	3.86c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.96c.
Soft steel bars, squares and hexagons	4.11c.
Hot-rolled strip	4.21c.
Hot-rolled annealed sheets (No. 24)	4.71c.
Galvanized sheets (No. 24)	5.36c.
Cold-finished steel bars	4.41c.
Structural rivets (keg lots)	4.71c.
Boiler rivets, cone head (keg lots)	4.81c.
Track spikes (keg lots)	4.26c.
Track bolts (keg lots)	5.71c.
Black annealed wire (No. 6 to No. 9 incl.)	4.66c.
Com. wire nails and cement coated nails	
1 to 14 kegs	3.31c.

Per Cent Off List

Machine bolts and carriage bolts, 1/2x6 and smaller	65-10
Larger	65
Coach and lag screws	65
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	65

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 3999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

Base per Lb.

Mild steel bars, rounds	4.10c.
Structural shapes	4.00c.
Plates	4.00c.
Cold-finished bars	4.55c.
Hot-rolled annealed sheets, No. 24	4.85c.
Galvanized sheets, No. 24	5.50c.

On mild steel bars, shapes and plates the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

Base per Lb.

Mild steel bars and small shapes	4.00c.
Structural shapes	3.90c.
Reinforcing bars, 5 to 15 tons	3.11c.
Plates	3.90c.
Hot-rolled sheets, No. 10	3.95c.
Bands	4.20c.
Hoops	4.45c.
Special threading steel	4.15c.
Checkered floor plates 1/4 in. and heavier	5.80c.
Galvanized sheets, No. 24, 100 bds. or more	\$4.70
Cold-rolled rounds, hexagons, squares and flats, 1000 lb. and more	\$4.50

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets the base applies on orders 400 to 3999 lb.

All prices are f.o.b. consumers' plants.

For second zone add 10c. per 100 lb. for trucking.

CHATTANOOGA

Base per Lb.

Mild steel bars	3.96c.
Iron bars	3.96c.
Reinforcing bars	3.96c.
Structural shapes	4.01c.
Plates	4.01c.
Hot-rolled sheets No. 10	3.91c.
Hot-rolled annealed sheets, No. 24*	4.06c.
Galvanized sheets No. 24*	4.76c.
Steel bands	4.16c.
Cold-finished bars	4.86c.

* Plus mill item extra.

MEMPHIS

Base per Lb.

Mild steel bars	4.31c.
Shapes, bar size	4.31c.
Iron bars	4.31c.
Structural shapes	4.21c.
Plates	4.21c.
Hot-rolled sheets, No. 10	4.26c.
Hot-rolled annealed sheets, No. 24	4.91c.
Galvanized sheets, No. 24	5.66c.
Steel bands	4.56c.
Cold-drawn rounds	4.80c.
Cold-drawn flats, squares, hexagons	6.80c.
Structural rivets	4.35c.
Bolts and nuts, per cent off list	55
Small rivets, per cent off list	60

NEW ORLEANS

Base per Lb.

Mild steel bars	4.20c.
Reinforcing bars	3.14c.
Structural shapes	4.10c.
Plates	4.10c.
Hot-rolled sheets, No. 10	4.10c.
Steel bands	4.75c.
Cold-finished steel bars	5.10c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	\$3.30
Bolts and nuts, per cent off list	65

PACIFIC COAST

Base per Lb.

	San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	4.05c.	4.30c.	4.25c.
Shapes, standard	4.05c.	4.30c.	4.25c.
Soft steel bars	4.20c.	4.30c.	4.45c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.975c.	2.975c.	3.625c.
Hot-rolled annealed sheets (No. 24)	5.15	5.05c.	5.35c.
Hot-rolled sheets (No. 10)	4.30c.	4.50c.	4.50c.
Galv. sheets (No. 24 and lighter)	5.85c.	5.55c.	5.90c.
Galv. sheets (No. 22 and heavier)	6.10c.	5.70c.	5.90c.
Cold-finished steel			
Rounds	6.80c.	6.85c.	7.10c.
Squares and hexagons	8.05c.	8.10c.	7.10c.
Flats	8.55c.	8.60c.	8.10c.
Common wire nails—base per keg less carload	\$3.65	\$3.60	\$3.70

All items subject to differentials for quantity.

REFRACTORIES PRICES

Fire Clay Brick

Per 1000 f.o.b. Works

First quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	\$54.00
First quality, New Jersey	56.00
Select, Ohio	49.00
Second quality, Pennsylvania, Maryland, Kentucky, Missouri and Illinois	49.00
Second quality, New Jersey	51.00
No. 1, Ohio	46.00
Ground fire clay, per ton	8.00
5 per cent trade discount on fire clay brick	

Silica Brick

Per 1000 f.o.b. Works

Pennsylvania	\$54.00
Chicago District	63.00
Birmingham	54.00
Silica cement per net ton (Eastern)	9.50
5 per cent trade discount on silica brick	

Chrome Brick

Per Net Ton

Standard f.o.b. Baltimore, Plymouth Meeting and Chester	\$49.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	49.00

Magnesite Brick

Per Net Ton

Standard f.o.b. Baltimore and Chester, Pa.	\$69.00
Chemically bonded, f.o.b. Baltimore	59.00

Grain Magnesite

Per Net Ton

Imported, f.o.b. Baltimore and Chester, Pa. (in sacks)	\$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	43.00
Domestic, f.o.b. Chewelah, Wash.	25.00

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	25.00
Delivered Brooklyn	27.27
Delivered Newark or Jersey City	26.39
Delivered Philadelphia	25.76
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Buffalo, Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	24.00
F.o.b. Jackson, Ohio	25.75
Delivered Cincinnati	24.07
F.o.b. Duluth	24.50
F.o.b. Provo, Utah	22.00
Delivered San Francisco, Los Angeles or Seattle	25.00
F.o.b. Birmingham*	20.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 70 and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same.

Basic

F.o.b. Everett, Mass.	\$25.75
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	24.50
F.o.b. Buffalo	23.00
F.o.b. Neville Island, Sharpsville and Erie, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago and Granite City, Ill.	23.50
Delivered Cincinnati	24.51
Delivered Canton, Ohio	24.76
Delivered Mansfield, Ohio	25.26
F.o.b. Jackson, Ohio	25.50
F.o.b. Birmingham	19.00

Bessemer

F.o.b. Everett, Mass.	\$26.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	26.00
Delivered Boston Switching District	26.50
Delivered Newark or Jersey City	27.39
Delivered Philadelphia	26.76
F.o.b. Buffalo and Erie, Pa., and Duluth	25.00
F.o.b. Neville Island and Sharpsville, Pa.; Youngstown, Cleveland, Toledo and Hamilton, Ohio; Detroit; Chicago	24.50
F.o.b. Birmingham	25.50
Delivered Cincinnati	25.51
Delivered Canton, Ohio	25.76
Delivered Mansfield, Ohio	26.26

Low Phosphorus

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	\$28.50
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Gray Forge

Valley or Pittsburgh furnace	\$23.50
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Charcoal

Lake Superior furnace	\$27.00
Delivered Chicago	30.04

Canadian Pig Iron

Per Gross Ton

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	\$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	\$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.	
Per Gross Ton	
Domestic, 80% (carload)	\$102.50

Spiegeleisen

Per Gross Ton Furnace	
Domestic, 19 to 21%	\$33.00
F.o.b. New Orleans	33.00

Electric Ferrosilicon

Per Gross Ton Delivered	
50% (carloads)	\$69.50
50% (ton lots)	77.00
75% (carloads)	126.00
75% (ton lots)	136.00

Silvery Iron

Per Gross Ton	
F.o.b. Jackson, Ohio, 5.00 to 5.50%	\$27.50

For each additional 0.5% silicon up to 17%, 50c. a ton is added.
The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton	
10.00 to 10.50%	\$33.50
10.51 to 11.00%	34.00
11.01 to 11.50%	34.50
11.51 to 12.00%	35.00
12.01 to 12.50%	35.50
12.51 to 13.00%	36.00
13.01 to 13.50%	36.50
13.51 to 14.00%	37.00
14.01 to 14.50%	37.50
14.51 to 15.00%	38.00
15.01 to 15.50%	38.50
15.51 to 16.00%	39.00
16.01 to 16.50%	39.50
16.51 to 17.00%	40.00

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads	\$1.70
Ferrotungsten, lots of 5000 lb.	\$1.75
Ferrotungsten, smaller lots	\$1.80
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in carloads, and contract	10.50c.
Ferrochromium, 2% carbon	16.50c. to 17.00c.
Ferrochromium, 1% carbon	17.50c. to 18.00c.
Ferrochromium, 0.10% carbon	19.50c. to 20.00c.
Ferrochromium, 0.06% carbon	20.00c. to 20.50c.
Ferrovandium, del. per lb. contained V	\$2.70 to \$2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y.	\$2.50
Ferrocobaltititanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	\$142.50
Ferrocobaltititanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	\$157.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with 3% unitage, freight equalized with Rockdale, Tenn., per gross ton	58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with 3% unitage, freight equalized with Nashville, Tenn.	75.00
Ferromolybdenum, per lb. Mo del.	95c.
Calcium molybdate, per lb. Mo del.	80c.
Silico spiegel, per ton, f.o.b. furnace, carloads	\$45.00
Ton lots or less, per ton	50.00
Silico-manganese, gross ton, delivered.	
3% carbon grade	101.50
2.50% carbon grade	106.50
2% carbon grade	111.50
1% carbon grade	121.50

Note: Spot prices are \$5 a ton higher except on 75 per cent ferrosilicon on which premium is \$10 a ton.

ORES

Lake Superior Ores

Delivered Lower Lake Ports

Per Gross Ton	
Old range, Bessemer, 51.50%	\$5.25
Old range, non-Bessemer, 51.50%	5.10
Mesabi, Bessemer, 51.50%	5.10

Mesabi, non-Bessemer, 51.50%	\$4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.A.F. Philadelphia or Baltimore

Per Unit	
Iron, low phos., copper free, 55 to 58% dry, Algeria, nominal	17.00c.
Iron, low phos., Swedish, average, 68½% iron	Nominal
Iron, basic or foundry, Swedish, aver. 65% iron	Nominal
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	45c.
Man., African, Indian, 44-48%	Nominal
Man., African, Indian, 49-51%	Nominal
Man., Brazilian, 46 to 48½%	Nominal

Per Net Ton Unit

Tungsten, Chinese, wolframite, duty paid delivered nominal	\$22.00 to \$24.00
Tungsten, domestic, scheelite delivered	Nominal
Chrome ore (lump) c.i.f. Atlantic Seaboard, per net ton:	
South African	\$16.00
Rhodesian, 45%	23.00
Rhodesian, 48%	25.00
Turkish, 48-49%	24.50 to \$25.00
Turkish, 45-46%	20.50 to 21.00
Turkish, 44%	19.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton:	
52%	\$25.50 to \$26.00
50%	24.50
48-49%	24.50 to 25.00

FLUORSPAR

Per Net Ton

Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	\$19.00 to \$20.00
Domestic, barge and rail	\$19.50 to 21.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	\$20.00 to 21.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	35.00

FUEL OIL

Per Gal.

F.o.b. Bayonne or Baltimore, No. 3 distillate	4.25c.
F.o.b. Bayonne or Baltimore, No. 4 industrial	3.75c.
Del'd Ch'go, No. 3 industrial	4.35c.
Del'd Ch'go, No. 5 industrial	3.90c.
Del'd Cleve'd, No. 3 distillate	5.75c.
Del'd Cleve'd No. 4 industrial	5.75c.
Del'd Cleve'd No. 5 industrial	5.00c.

COKE AND COAL

Coke Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	\$4.60 to \$4.75
Foundry, f.o.b. Connellsville, Prompt	5.25 to 6.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.85 to 11.30
Foundry, by-product, Philadelphia	10.60
Foundry, by-product, delivered Cleveland	11.00
Foundry, by-product, delivered Cincinnati	10.50
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	11.00 to 11.50
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal Per Net Ton

Mine run steam coal, f.o.b. W. Pa. mines	\$1.50 to \$1.75
Mine run coking coal, f.o.b. W. Pa.	1.75 to 1.90
Gas coal, ¼-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	1.00 to 1.25
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

NIAGARA

BRAND

FERRO - ALLOYS

For High Quality Steels

FERRO SILICON
ALL GRADES

FERRO CHROMIUM
HIGH CARBON

FERRO CHROMIUM
LOW CARBON

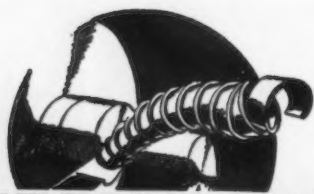
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PITTSBURGH METALLURGICAL CO., Inc.

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THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... *General Motors and Chrysler to spend millions in expansion programs.*

° ° °

... *Other than Detroit, sales are tapering after record-breaking April volume.*

° ° °

... *One builder revises prices downward in face of buyer resistance.*

Detroit

HEAVERY buying programs are indicated by the inquiries that are out to cover the new General Motors and Chrysler plants and expansions that have just been revealed. The G.M. Syracuse plant, where steering gears are to be manufactured for Eastern plants assembling Chevrolet, Pontiac, Oldsmobile and Buick cars, has not yet been equipped and the amount of machinery to be installed has not been revealed. This equipment will go into the Brown-Lipe-Chapin factory building. With the G.M. diesel program and Chevrolet's Tonawanda program still keeping machinery salesmen busy, new G.M. projects are at Lockport, Syracuse, Anderson (Ind.), and Dayton. The Chrysler projects include, besides Windsor, where most of the buying is completed, Chrysler-Jefferson, Plymouth and DeSoto. At Chrysler-Jefferson, where the machine shop is being greatly enlarged, \$750,000 will be spent for machinery, and another \$100,000 for rearranging present equipment. Plymouth, which is planning a new transmission for its cars, will spend \$800,000 for general equipment. The DeSoto project will be mostly for a body and paint shop.

Pittsburgh

DEALERS are still swamped with inquiries, with no indications of a let-up. Orders on the other hand have slowed up a bit within the past week, but this is ascribed to the fact that customers are exceptionally busy digesting quotation data requested recently. April business was consider-

ably ahead of the volume placed in March. Transactions closed during the first four months of this year by some dealers are almost as good as the total 1936 volume of business. The one sore spot continues to be the delivery situation and with the vacation season approaching, production at many manufacturing plants will be slowed up, thereby causing further extended deliveries. Carnegie-Illinois Steel Corp. has been inquiring for machine tools in conjunction with its sheet strip mill to be constructed near Clairton, Pa.

Cleveland

SALES of machine tools by manufacturers have tapered off slightly this month, although the volume of business is holding up well. Demand for automatic screw machines continues quite active. April sales by a leading local manufacturer exceeded shipments. Foreign demand continues plentiful. Late inquiries include 20 turret lathes for Japan and 11 for France. Some export orders for turret lathes have been taken for delivery during the first quarter next year, the manufacturer being unwilling to take this business for earlier delivery because its quota of foreign orders for the year had already been filled.

Business with dealers has experienced a slight decline. No inquiries of any size are pending.

New York

APRIL bookings were the greatest of any month this year, and closely approached the record set in

December. A natural reaction has set in this month thus far as a result of the heavy buying in the last half of April, but most sellers do not view this lull as anything but temporary. One, however, states that inquiries have fallen off sharply, and attributes significance to this factor because purchases by manufacturers are usually made on the strength of incoming orders, and not because of work going through the shop. All large industrial accounts seem active as ever, nevertheless, and small lists are coming forth regularly every month. The Navy Department is buying equipment for additional units to the fleet from time to time, lathes, grinders and drills being especially in demand.

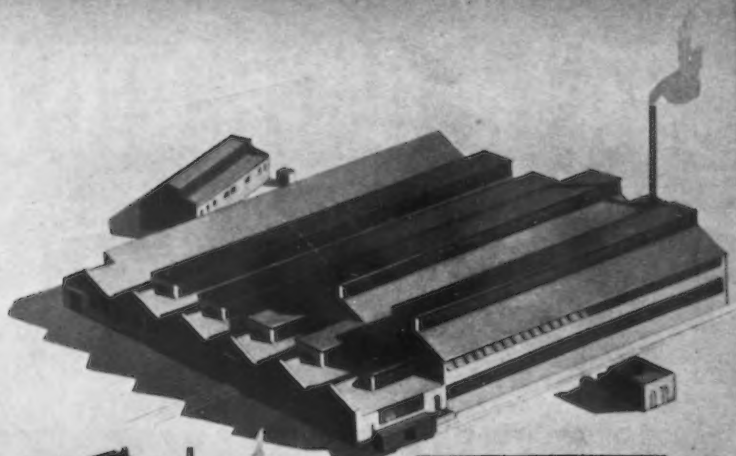
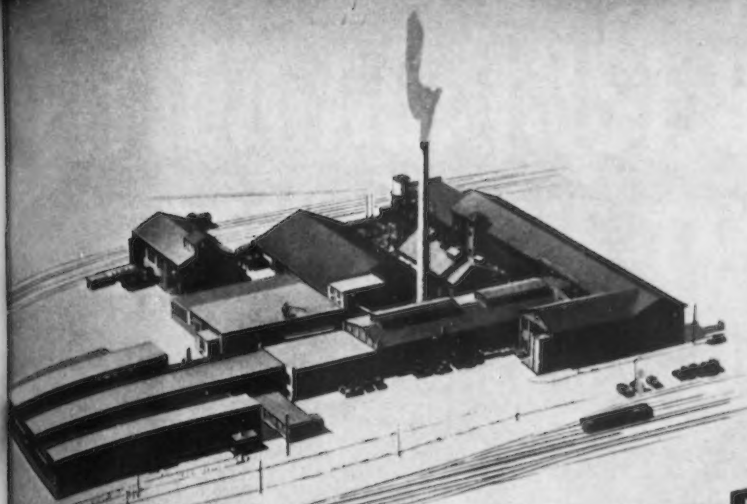
Cincinnati

SLIGHT easing of machinery demand in this area occurred the past week, but opinion termed it a minor fluctuation. No trend toward general reduction appears imminent, since bona fide inquiries are plentiful, and general feeling remains high. Automobile manufacturers were active for new equipment, but general ordering was slightly lower than the preceding week. An order for an undisclosed number of crankshaft lathes was reported and business in millers and broachers was active. Lighter lathes and drilling machinery absorbed the bulk of reduced demands. Production rate is still high, although builders report a lack of sufficient skilled labor to boost operations to full capacity in all units. Deliveries are still extended, although the situation is reported not to be unduly bothersome.

Chicago

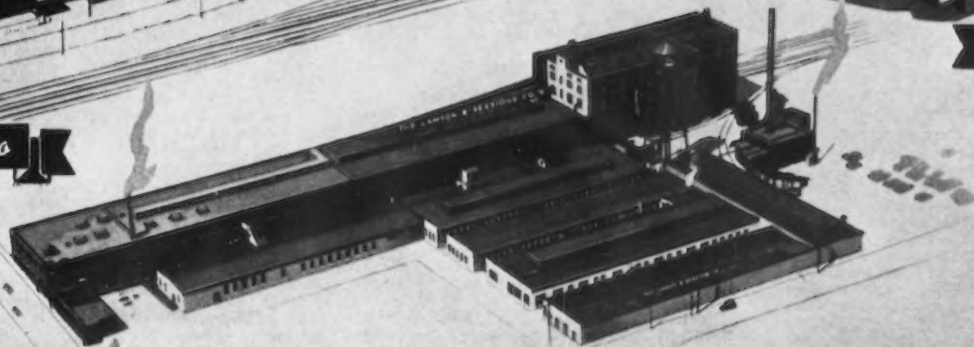
THE matter of prices for machine tools is very much alive among both buyers and sellers. New price advances are no longer in evidence, and one builder has announced a reduction which is a direct reflection of buyers' resistance. Notwithstanding the above situation this market is quite active and it offers much for the future. Dealers were considerably impressed by the spirit and enthusiasm shown at the Chicago meeting of machine tool builders who reported the long range outlook as being very favorable. The Rock Island is inquiring for an 18-in., and a 20-in. engine lathe to be delivered to its Silvis, Ill., shops.

Maine Steel, Inc., 80 Second Street, South Portland, Me., has purchased the plant and business of the Maine Steel Products Co. The new company will continue manufacturing and selling marine and industrial hardware and snow removal equipment, and has assumed all sales contracts and merchandise obligations of the old company.

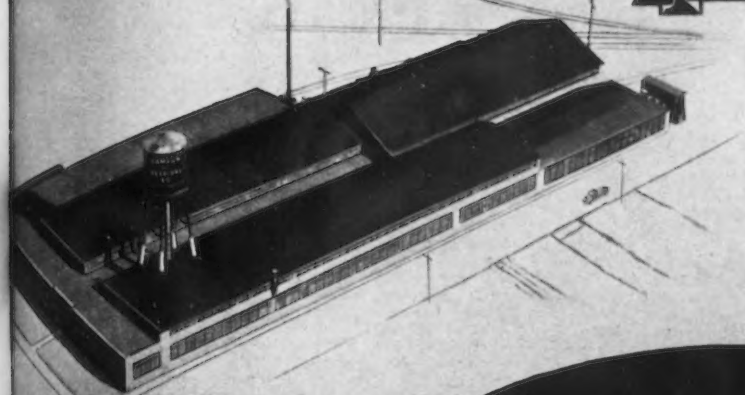


Kent, Ohio

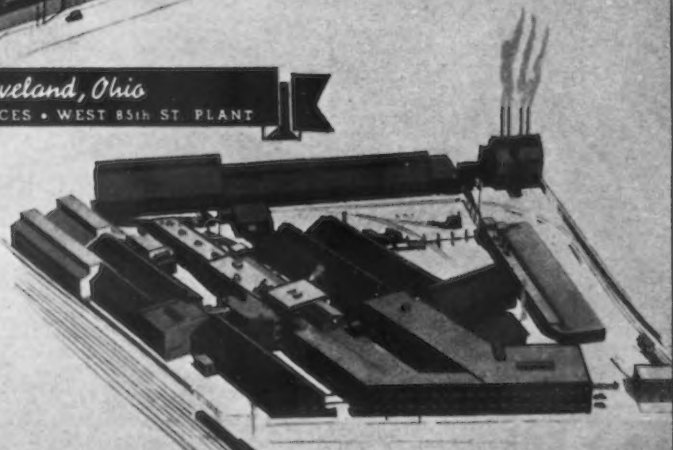
Birmingham, Ala.



Cleveland, Ohio
GENERAL OFFICES • WEST 85th ST. PLANT



Chicago, Ill.



Cleveland, Ohio
EAST 63rd ST. PLANT

THESE ARE OUR
Five Plants

EACH one of them is large enough to house the manufacture of any of industry's larger products—such as mill cranes, automobiles, tractors, steam shovels—but each of them is devoted to producing bolts and nuts and allied fastenings. Millions of them a day. Making coppers so small they have to be weighed instead of counted, and bolts up to three inches in diameter—LAMSON & SESSIONS keeps five plants busy meeting the requirements of those who use and distribute bolts and nuts . . . Five plants offer significant

advantages—a dependable source of supply that is not likely to dry up over night. Decentralized production means you do not "put all your eggs in one basket." Large enough to handle the largest orders with efficiency—LAMSON & SESSIONS is also experienced enough through 70 years of operation to realize that small orders must be handled with equal consideration. Your inquiries are invited. THE LAMSON & SESSIONS COMPANY, General Offices, Cleveland, Ohio. Plants at Cleveland and Kent, Ohio; Chicago and Birmingham.

Your Jobber stocks the LAMSON Line

LAMSON & SESSIONS



PLANT EXPANSION AND EQUIPMENT BUYING

◀ NORTH ATLANTIC ▶

Lone Star Cement Corp., 342 Madison Avenue, New York, formerly International Cement Corp., has authorized fund of about \$1,000,000 for expansion and improvements in mills in different parts of country, including installation of machinery.

Schenley Products Co., 20 West Fortieth Street, New York, has asked bids for multi-story addition to plant of Bernheim Distilling Co., Seventeenth and Breckenridge Streets, Louisville, a subsidiary, for storage and distribution. Cost over \$100,000 with equipment. Plans are under way for a mechanical-bottling unit at same plant. Carl J. Kiefer, Schmidt Building, Cincinnati, is consulting engineer.

General Electric Co., Schenectady, N. Y., has plans for one-story addition, 90 x 300 ft., to electric refrigerator plant on East Lake Road, Erie, Pa., primarily for steel refrigerator cabinet manufacture. Cost over \$150,000 with equipment. H. L. R. Emmet is manager at Erie works.

Royal Utilities Co., Inc., Brooklyn, manufacturer of oil burners and parts, has leased two-story building at 91 Irving Place for plant.

Mahoney-Clarke, Inc., 217 Pearl Street, New York, heavy hardware products, contractors' equipment, etc., has acquired property at 37-09-19 Vernon Boulevard, Long Island City, 100 x 150 ft., improved with one and two-story buildings, for new storage and distributing plant.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 21 for one electric arc welding set and spare parts for Brooklyn Navy Yard (Schedule 668).

John Eichler Brewing Co., 3582 Third Avenue, New York, has let general contract to Hubener & Echer, 743 Melrose Avenue, Bronx, for two-story addition for storage and distribution. Cost over \$60,000 with equipment. Harley & Ellington, Inc., Stroh Building, Detroit, is architect and engineer.

Allied Bronze Co., Long Island City, N. Y., has leased about 10,000 sq. ft. in building at 10-01 Forty-third Avenue for manufacture of bronze, brass and kindred metal products.

Signal Corps Procurement District, Army Base, Fifty-eighth Street and First Avenue, Brooklyn, asks bids until May 20 for loading coil cases and telephone cable in lots of 1010 to 21,210 ft. (Circular 170); until May 28, submarine mine cable in lots of 100,000 to 120,000 ft. (Circular 168).

National Can Co., 110 East Forty-second Street, New York, has let structural steel contract to American Bridge Co., Pittsburgh, for four-story addition to branch plant at Baltimore, 50 x 185 ft., to cost close to \$150,000 with equipment. Brown & Matthews, Inc., 122 East Forty-second Street, New York, is engineer in charge of erection.

Commanding Officer, Ordnance Department, Picatinny Arsenal, Dover, N. J., asks bids until May 28 for one automatic machine for manufacture of detonator cups (Circular 787), three lots of practice bombs, each lot of 15,000 to 25,000 assemblies (Circular 801).

Hatfield Wire & Cable Co., Hillside, N. J., has let general contract to Fatzler Co., 11 Hill Street, Newark, for one-story addition, 60 x 120 ft., in part for storage and distribution. Cost over \$40,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 18 for one motor-driven, self-feed rip saw (Schedule 676); until May 21, one

motor-driven high-speed radial drill press (Schedule 678).

Milton Steel & Supply Co., Milton, Pa., has plans for one-story steel fabricating shop, 40 x 65 ft. Cost about \$45,000 with equipment.

United States Engineer Office, Philadelphia, asks bids until May 18 for two sets after breast line sheave, cast steel brackets; two sets forward breast line sheave, cast steel brackets; and one set each of similar cast steel brackets, and four patterns (Circular 438).

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until May 18 for two motor-driven engine lathes, 14 x 30 in. (Circular 670), 216 guide bushings (Circular 669); until May 19, 8,13 or 18 spindle heads for caliber 0.30 head-turning machine (Circular 617), one caliber 0.50 case draw press (Circular 618), one or two caliber 0.30 case body annealing machines (Circular 619).

◀ BUFFALO DISTRICT ▶

Beech-Nut Packing Co., Canajoharie, N. Y., packer and canner of food products, has acquired 32-acre tract at Webster, N. Y., and will use part of property for early construction of new one-story branch canning plant, about 24,000 sq. ft. floor space. Cost over \$80,000 with equipment.

Shepard-Niles Crane & Hoist Corp., Montour Falls, N. Y., has begun construction of one-story addition. Cost close to \$50,000 with equipment.

Rushmore Paper Mills, Inc., Natural Dam, N. Y., manufacturer of tissue and light-weight paper stocks, plans rebuilding part of mill recently destroyed by fire. Loss over \$200,000 with equipment.

◀ NEW ENGLAND ▶

Bridgeport Brass Co., Grand Avenue, Bridgeport, Conn., has let general contract to Stone & Webster Engineering Corp., 49 Federal Street, Boston, for one-story rolling mill, 285 x 500 ft., and two-story general engineering and machine shop, 126 x 167 ft. Cost about \$750,000 with equipment. Company has also made award to Hewlett Construction Co., Bridgeport, for one-story unit, 120 x 140 ft., on Housatonic Avenue, recently noted in these columns, primarily as a casting shop.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until May 27 for two pneumatic hand-type marking machines (Circular 229); until May 28, one automatic temperature controlling and recording equipment complete (Circular 234).

Smith Paper, Inc., Lee, Mass., manufacturer of tissue and kindred paper stocks, has plans for one-story addition to local Eagle mill, 140 x 160 ft., for expansion in machine department, and for another one-story extension to same mill for expansion in other operating divisions. Cost over \$100,000 with equipment. R. A. Packard is company engineer in charge.

C. W. Hazelett, 170 Overlook Drive, Greenwich, Conn., has plans for one-story machine shop, 35 x 113 ft. Cost close to \$40,000 with equipment. Carl Ludwig, 1 West Elm Street, is engineer.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 21 for one motor-driven dowel machine (Schedule 677), one motor-driven cut-off machine (Schedule 680) for Boston Navy Yard; six stockless anchors, each 25,000-lb., for Fore River Station, Mass., and Sewall's Point Navy Yard (Schedule 671).

Norton Co., Worcester, Mass., will erect a new building adjoining its plant, 190 x 300 ft., to house its grinding wheel finishing department. It will be Aiken transverse monitor type design providing light from overhead, and will be ready for occupancy Nov 1. Cost about \$300,000.

◀ WASHINGTON DIST. ▶

Chief, Bureau of Yards and Docks, Navy Department, Washington, asks bids until June 2 for two 250-ton traveling electric gantry cranes, and transfer car for transporting loaded crane at Naval Proving Ground, Dahlgren, Va. (Specifications 8395); also bids (no closing date stated) for buildings and equipment at Naval Experimental Model Basin, Carderock, Md., including electric cranes and monorail hoists, electric trolley system, three 150-hp. oil-fired boiler units, and combined boiler and incinerator, air-conditioning system, water supply and water purification systems, etc. (Specifications 7689).

Glenn L. Martin Co., Middle River, Baltimore, manufacturer of airplanes and parts, has let general contract to Carl W. Schmidt, Munsey Building, for three additions, comprising main building, 300 x 450 ft., and 75 ft. high, for assembling division; three-story engineering building, 60 x 300 ft.; and one-story laboratory, 48 x 78 ft. New units will represent part of a \$2,000,000 expansion and improvement program recently authorized. Albert Kahn, Inc., Detroit, is architect and engineer. Gardner W. Carr is vice-president and general manager.

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until May 20 for three motor-driven shearing and punching machines (Proposal 398-134); until May 22, ignition and carburetor repair equipment, 19 test benches for automobiles and trucks (Proposal 398-141); until May 27, 37 gasoline driven electric arc welding and power-generating machines, and seven electric motor-driven arc welding machines (Proposal 398-146).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 18 for tinners', coppersmiths' and carpenters' mallets (Schedule 623) for Brooklyn and Mare Island Navy Yards; electrical measuring instruments (Schedule 655), calipers, dividers, gages, planes and squares (Schedule 637); until May 21, motor-generator sets and spare parts (Schedule 647), axes, hammers, hatchets and sledges (Schedule 645), clamps and punches (Schedule 639), countersinks and reamers (Schedule 643); until May 25, one high-temperature electric furnace, complete with pyrometer and temperature control (Schedule 663), taps, dies, tap wrenches, die stocks and threading sets (Schedule 656), wood-boring bits, chisels and knives (Schedule 648), flexible steel cable (Schedule 657) for Eastern and Western yards.

◀ SOUTH ATLANTIC ▶

Southern Railway Co., Washington, Engineering Department, has let general contract to Ray M. Lee Co., 337 West Peachtree Street, N.W., Atlanta, Ga., for addition to engine house and repair shops at Inman yards, Atlanta, also improvements in present units. Cost over \$40,000 with equipment.

City Council, New Smyrna, Fla., asks bids until May 29 for diesel engine unit and auxiliary equipment, and one crane for municipal electric power plant.

Atlanta Stove Works, Inc., 112 Krog Street, N.E., Atlanta, Ga., has awarded general contract to E. O. Smithfield, Red Rock Building, for one-story addition and improvements in present plant. Cost close to \$30,000 with equipment.


◀ SOUTH CENTRAL ▶

O.F.C. Distillery (Blantons), Frankfort, Ky., has awarded general contract to Frank Messer & Sons, Inc., 2515 Burnet Street, Cincinnati, for one and multi-story addition, primarily for storage and distribution. Cost over \$50,000 with equipment.

Compressed Industrial Gases, Inc., Alton Park, Chattanooga, Tenn., manufacturer of industrial oxygen, acetylene, nitrogen, etc., has plans for addition and installation of equipment. Cost over \$45,000 with machinery. Main offices of company are at 221 North LaSalle Street, Chicago. E. J. Lowrey is manager at Chattanooga.

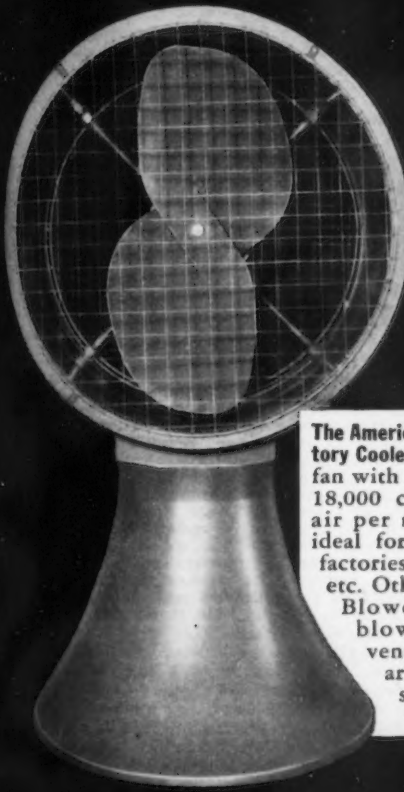
Tennessee Electric Power Co., Chatta-

PITTED AGAINST SCORCHING HEAT MEN PROVE THEIR "Mettle"

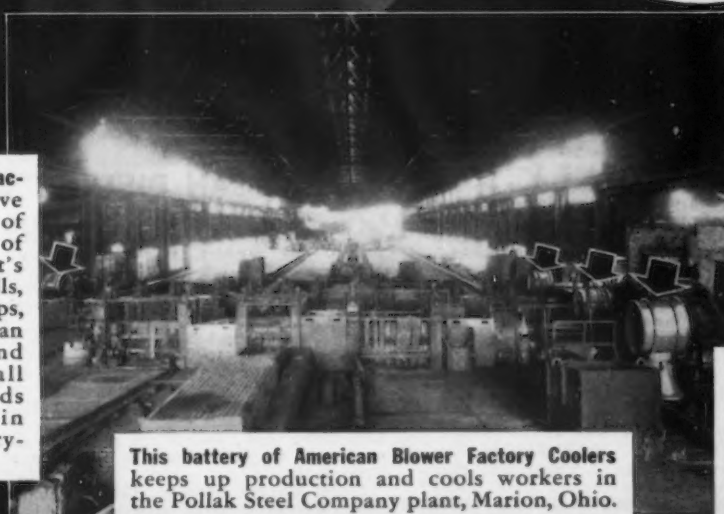


In the modern welding plant American Blower electric ventilating equipment furnishes fresh air for workers and special exhaust systems carry away the fumes and excessive heat of individual processes. That's the way to speed production in your plant, too.


"Working around molten metal tests a man's strength and stamina," says Sam Tietsel, steel worker. "A fellow needs all the relief a modern ventilating system can give." American Blower Factory Coolers (left) build energy, boost production.



The American Blower Factory Cooler is a massive fan with a capacity of 18,000 cubic feet of air per minute. It's ideal for steel mills, factories, forge shops, etc. Other American Blower fans and blowers for all ventilating needs are carried in stock everywhere.



This battery of American Blower Factory Coolers keeps up production and cools workers in the Pollak Steel Company plant, Marion, Ohio.



Call in an American Blower air technician. He'll give you all the data on all types of ventilating and air handling equipment.

AMERICAN BLOWER CORPORATION

Division of American Radiator and Standard Sanitary Corp.

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BAD AIR IS BAD BUSINESS - GOOD VENTILATION IS GOOD BUSINESS

nooga, Tenn., plans new steam-electric generating plant at Bordeaux, on Cumberland River, with initial capacity of 25,000 kw. Extensions will be made in transmission lines for connection with new station, including power substations and switching stations. Entire project will cost about \$2,000,000.

Board of Education, Lexington, Ky., plans installation of machine and other manual training shops in new two-story high school on Tatescreek Pike, for which general contract has been let to Gilson Taylor Co., East Third Street. Cost close to \$280,000. L. K. Frankel and John J. Curtis, both Lexington, are architects.

Newport Industries, Inc., Bay Minette, La., manufacturer of rosin, turpentine and other naval stores, has approved plans for extensions and improvements in reduction works, including new equipment. Cost about \$50,000 with equipment.

◀ SOUTHWEST ▶

Williams Patent Crusher & Pulverizer Co., 813 Montgomery Street, St. Louis, manufacturer of grinding, crushing and pulverizing machinery, has let general contract to T. Jarvis Co., Railway Exchange Building, for one and two-story addition, 52 x 115 ft. Cost over \$50,000 with equipment. Gray & Pauley, 3800 West Pine Street, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 21 for one motor-driven pedestal-type riveting hammer for Kansas City, Mo. (Schedule 694).

Swift & Co., St. Joseph, Mo., meat packers, have asked bids on general contract for group of eight buildings and modernization in plant at South St. Joseph, including additional equipment. Cost over \$75,000 with machinery. Main offices are in Chicago.

Contracting Officer, Office of Quartermaster, Fort Riley, Kan., asks bids until May 18 for following motor-driven machines: One drill press, one planer, one jointer, one shaper, one bench saw, and seven band saws (Proposal 735-66); until May 20, two agricultural-type tractors, high-wheel, with attachments (Proposal 735-67).

Austin Concrete Works, Inc., 403 Paul Street, Austin, Tex., manufacturer of cast concrete pipe, etc., plans several one-story units at Pleasant Valley Road and East Fifth Street for production of reinforced-concrete pipe up to 42-in. Cost close to \$45,000 with equipment. H. E. Wattinger is general manager.

United States Engineer Office, Federal Building, Galveston, Tex., asks bids until May 17 for two dredging pumps and two extra impellers for dredging pumps (Circular 264).

◀ OHIO AND INDIANA ▶

Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland, manufacturer of electric motors, generators and parts, has let general contract to J. L. Hunting Co., Ninth-Chester Building, for one-story addition. Cost close to \$50,000 with equipment. Wallace H. Hatch, Hippodrome Building, is architect.

Pure Oil Co., 35 East Wacker Drive, Chicago, plans extensions and improvements in oil refinery at Heath, Ohio, including new cracking unit for gasoline production, treating plant, water cooling tower, stokers and other equipment. Cost over \$250,000 with equipment.

Martin Brothers Electric Co., 1858 East Fortieth Street, Cleveland, manufacturer of electrical appliances and equipment, has let general contract to Albert M. Higley Co., 2036 East Twenty-second Street, for two-story and basement plant, 120 x 150 ft. Cost about \$85,000 with equipment. Leonard L. Broida, 1643 Lee Road, is architect.

Contracting Officer, Material Division, Army Air Corps, Wright Field, Dayton, Ohio, asks bids until May 21 for slinger rings (Circular 712); until May 26, two motor-driven squaring, notching and slitting shears, two motor-driven sheet metal press brakes, one hand-operated sheet metal brake, one hand-operated box and pan sheet metal brake, two motor-driven slip roll formers, one hand-power slip roll former and one motor-driven sheet metal cutter (Circular 699); until May 27, 15 motor-driven milling machines (Circular 697); until May 28, two electric grinders

and three motor-driven portable grinders (Circular 697).

Guide Lamp Corp., West Twenty-fifth Street, Anderson, Ind., manufacturer of automobile lamps, headlights, etc., a division of General Motors Corp., has plans for one-story addition, 160 x 200 ft., for expansion in tool division and die-casting department. Cost over \$125,000 with equipment.

International Harvester Co., 606 South Michigan Avenue, Chicago, has let general contract to Bueshing-Hagerman Corp., 402 South Superior Street, Fort Wayne, Ind., for one-story addition to motor truck assembling plant at Fort Wayne, 150 x 300 ft. Cost over \$200,000 with equipment.

Board of Public Works, City Hall, Fort Wayne, Ind., plans extensions and improvements in municipal electric power plant, including new watertube boiler unit and other equipment. Cost about \$100,000. Froehlich & Emery Engineering Co., Second National Bank Building, Toledo, Ohio, is consulting engineer.

◀ MIDDLE WEST ▶

Middle West Instrument Co., 1870 West Ogden Street, Chicago, manufacturer of scientific instruments and equipment, plans new one and two-story plant at 313-33 South Honore Street. Cost over \$40,000 with equipment.

McGraw Electric Co., 120 South LaSalle Street, Chicago, manufacturer of electric household appliances and other electrical equipment, has plans for one-story and basement factory at Elgin, Ill. Cost close to \$200,000 with equipment. Olsen & Urbain, 228 North LaSalle Street, Chicago, are architects.

York Ice Machinery Corp., York, Pa., has let general contract to Parsons Construction Co., 710 North Twentieth Street, Omaha, Neb., for two-story and basement factory branch, storage and distributing plant, 68 x 122 ft., at Omaha. Cost over \$60,000 with equipment.

Rockford Drilling Machine Co., 120 Catherine Street, Rockford, Ill., has begun superstructure for one-story addition, 50 x 137 ft., primarily for storage and distribution, for which general contract recently was let to Linden & Son, 1102 Tenth Street.

John Amann, 5832 South Green Street, Chicago, manufacturer of wire products, has let general contract to N. Samuel, 165 West Wacker Drive, for one-story addition, 65 x 115 ft. Cost over \$50,000 with equipment. Joseph Bradstetter, 398 Damen Avenue, is architect.

Town Council, Hopkinton, Iowa, asks bids until May 25 for two diesel engine-generator units, and auxiliaries, switchboard and instruments, electrical distributing lines, etc., for municipal electric power plant. A. S. Harrington, Baum Building, Omaha, Neb., is consulting engineer.

Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago, manufacturers of engines, motors, stokers and other machinery, have leased two-story building, about 13,000 sq. ft. floor space, at 1901-7 West Roosevelt Road for stoker division.

City Council, Bellevue, Iowa, asks bids until May 28 for extensions and improvements in municipal power plant, including new 500-hp. diesel engine-generator unit and auxiliary equipment.

◀ MICHIGAN DISTRICT ▶

Hayes Body Corporation, Grand Rapids, Mich., manufacturer of steel automobile bodies, car fenders, refrigerator stampings, etc., plans one-story addition. Company is arranging a bond issue of \$850,000, part of proceeds to be used for work.

Olds Motor Works, Lansing, Mich., a division of General Motors Corp., has let general contract to Reniger Construction Co., Lansing, for one-story addition, 195 x 675 ft., with extension, 130 x 225 ft., primarily for storage and distribution. Cost about \$400,000 with equipment. Albert Kahn, Inc., Detroit, is architect and engineer. C. L. McCuen is manager at local works.

Diesel Engine Division, General Motors Corp., Detroit, recently organized to manufacture diesel engines from 20 to 160 hp., has acquired 75-acre tract on Outer Drive, Detroit, for new plant, consisting of one-story units for foundries, machine shops, parts departments, assembling division, engineering laboratory and other structures. Work on initial units will begin

this month. Cost over \$1,000,000 with equipment. New division will be closely affiliated with Winton Engine Corp., Cleveland, and Electro-Motive Corp., La Grange, Ill., other units of parent company. William T. Crowe is general manager of new organization.

City Commission, Kalamazoo, Mich., plans extensions and improvements in municipal electric light and power station, and waterworks plant, with installation of new equipment. Cost about \$482,000 with machinery.

National Glass Co., Detroit, plans an expenditure of \$500,000 to \$600,000 for a new plant for manufacture of bottles at Trenton, Mich., where an 8-acre tract has recently been purchased.

◀ WESTERN PA. DIST. ▶

Union Supply Co., Frick Building, Pittsburgh, steel products, has let general contract to W. F. Trimble & Sons Co., 1719 Pennsylvania Avenue, for two and three-story storage and distributing plant, 162 x 265 ft. Cost over \$125,000 with equipment. J. Phillips Davis, Fulton Building, is architect.

Union Barge Line Corp., 302 Pennsylvania Avenue, Pittsburgh, plans new loading and unloading dock on Wolf River, Memphis, Tenn., installation to include 10-ton traveling whirler crane, conveyor and other mechanical-handling equipment.

Wheeling Steel Corp., Wheeling, W. Va., plans one-story building at Benwood works, about 100 x 200 ft., for storage and distribution. Cost over \$150,000 with equipment.

◀ PACIFIC COAST ▶

Lockheed Aircraft Corp., Empire Avenue and Victory Place, Burbank, Cal., has let general contract to J. V. McNeil Co., 5860 Avalon Boulevard, Los Angeles, for two one-story additions, about 20,000 and 10,000 sq. ft. floor space respectively for new assembling unit and for expansion in processing plant. Cost over \$75,000 with equipment. John and Donald B. Parkinson, Title Insurance Building, Los Angeles, are architects.

Constructing Quartermaster, Sacramento Air Depot, Sacramento, Cal., asks bids until May 24 for 10,000 gal. steel tank, valves, couplings, wire rope, galvanized wrought iron pipe, plugs, tees, ells, gas meters, switches and other equipment (Proposal 6870-22).

Eastside Winery, Lodi, Cal., has asked bids on general contract for one-story addition, 38 x 112 ft., in part for storage and distribution. Cost over \$30,000 with equipment.

Puget Sound Pulp & Timber Co., Bellingham, Wash., has let general contract to Harold S. Wright & Co., 2210 Second Street, Seattle, for one-story addition to sulphite pulp mill for expansion in machine division. Other units will be built later. Entire project will cost over \$350,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until May 25 for one bolt-pointing and threading machine (Circular 670) for Mare Island Navy Yard; two light-duty engine lathes (Schedule 674) for Mare Island and San Diego Naval Air Station; 12 centrifugal purifiers, with control appliances and spare parts (Schedule 666) for Mare Island and Portsmouth yards; one wire-straightener and cutting machine (Schedule 684), two precision lathes (Schedule 691), one single-spindle automatic screw machine (Schedule 686) for San Diego Naval Air Station, all machines to be motor driven.

Rio Brewing Co., 668 Rio Street, Los Angeles, has plans for two-story addition, 50 x 71 ft., primarily for storage and distribution. Cost about \$45,000 with equipment. Arlos R. Sedgley, 910 North Serrano Avenue, is architect.

Bureau of Reclamation, Custom House, Denver, asks bids until May 17 for one motor-driven vertical-shaft, deep-well pumping unit, with 1000-gal. per min. capacity, under head of 140 ft., for installation at Grand Coulee Dam, Columbia Basin Project, Wash. (Specifications 921-D).

◀ FOREIGN ▶

Celotex, Ltd., London, England, recently organized as an interest of Celotex Corp., Chicago, manufacturer of insulating board, wall board and kindred products, has ac-

76 operations are performed simultaneously in this machine—76 tools work at one time, drilling, reaming and tapping manifold castings. One tool out of adjustment, causing excessive wear on it or its bushings, would cause inaccuracy. The use of Gulf Harmony Oil A, as recommended by the Gulf engineer in the picture, helps keep this machine in continuous and efficient operation.

WHEN THE
GULF ENGINEER IS
"in the picture"
MACHINES OPERATE
AT PEAK EFFICIENCY . . .

● There is a big plus value in using Gulf quality lubricants—a value that often brings savings greater than the cost of the lubricants themselves! It is the cooperative service extended by the Gulf engineer in the plant where the lubricants are used.

This is where the Gulf man feels at home—out in the plant, working with the men who keep the machinery producing. He is trained to work tactfully with plant men, speaks their language, knows the practical side of machine shop operation. For

his experience covers scores of plants, equipped with many types of machines. His aim is to increase the efficiency of lubrication and to effect savings in over-all operating costs.

Many plant operators have found that this service—extended to all users of Gulf lubricants without charge—has helped them make savings far greater than their total annual bill for lubricants. Isn't it more than likely that the lubrication of your equipment can be further improved?



GULF OIL CORPORATION
GULF REFINING COMPANY

GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.

quired property at Grand Canal and North Circular Road, Wembley district, London, for new mill, with power house and other mechanical departments. Cost about \$1,250,000 with machinery. B. G. Dahlberg, president of parent company, is one of officials of new organization.

Raleigh Cycle Co., Ltd., Faraday Road, Lenton, Nottingham, England, manufacturer of motorcycles and parts, plans erection of several one-story units for increase in parts production and assembling. Cost close to \$450,000 with machinery.

Ferodo, Ltd., Chapel-en-le-Firth, near Manchester, England, manufacturer of brake lining and kindred automotive products, plans one-story addition on adjoining site. Cost over \$250,000 with machinery.

Republic's New Wire Mill

(CONTINUED FROM PAGE 52)

storage, electro-galvanizing, fence, barbed wire and nail departments and the warehouse. Approximately 1200 lin. ft. of sub-floor tunnels were constructed to accommodate electrical controls and driving equipment for the wire drawing and nail machines. Removal of these facilities from the production floor further facilitates free-flowing operations provided by clear aisles. A metal roof deck, 1 3/4 in. deep covered by 1/2 insulation, was employed throughout most of the plant. In the cleaning house, where glass block was installed in place of conventional sash, due to the presence of corrosive acids, the roof is of book tile, supported on structural tees. Structural steel throughout the cleaning house is 3/4 in. minimum thickness.

Machine Tools an Important Factor In Prosperity

(CONTINUED FROM PAGE 37)

kind or another, some yet to be devised, costs are brought into line, other new industries will be born and a new category of employment opportunities will be created.

A year ago one of our members, Ralph E. Flanders, of Springfield, Vt., proposed a platform for industry, in which one plank reads as follows:

"Let industry cultivate the ability to survive and serve by improvement in quality and lowering cost through technical means, lowering prices to correspond, and thereby expanding employment and profit, while raising the standard of living."

Mr. Flanders' proposal so aptly expresses the function to which, economically, our plants are dedicated, that I believe his experience as a machine tool builder must have been his inspiration for it. Situated as we are, bending every effort to design and supply the master tools which are the foundation for all better living, machine tool builders can see the need for a clear-sighted, long range policy better than any others.

The wholehearted cooperation of every branch and department of industry to improve quality and lower costs through technical means, in the interest of lower prices and greater employment income, is a project worthy of every encouragement from Washington. It merits freedom from crippling restrictions, fearless reduction of unnecessary Government costs, and a sincere effort to administer the laws now enacted with fairness to both the management of all business enterprises and to their employees.

Machine Tool Men To Address A.S.M.E.

SOL EINSTEIN, vice-president and chief engineer of the Cincinnati Milling Machine Co., heads a group of four Cincinnati men who will speak to members of the American Society of Mechanical Engineers at their semi-annual meeting, May 17 to 21, in Detroit. Mr. Einstein, recognized as an authority on machine tools, will present a joint paper with Millard Romaine, who has been in charge of the development and application of broaching and die-sinking machines for Cincinnati Milling Machines & Cincinnati Grinders, Inc. They will speak at the modern machine shop practice session on Tuesday, May 18. Hans Ernst, research director of the company and a member of the A.S.M.E. sub-committee on metal cutting materials, will speak May 20, presenting a paper prepared by himself and Max Kronenberg on the grinding of cemented-carbide milling cutters. Mr. Ernst, who came from Melbourne, Australia, and served in the War with the Royal Canadian Air Force, has been in charge of research for his firm for 11 years. Mr. Kronenberg, engineer in the research department since July, 1936, has had a notable career in Germany as a consulting engineer and research worker for the German machine tool industry.

Industry Employing More Than in 1929

EMPLOYMENT in March was higher than in 1929 in the 25 major manufacturing industries, the National Industrial Conference Board reports.

The Conference Board's report is based on data covering wages, hours, and employment which are reported to it regularly each month by representative manufacturing companies throughout the country.

The number of wage earners employed in the reporting manufacturing industries in March was 0.5 per cent higher than in 1929. The growth of employment has been particularly marked during the past year, according to the survey, the average number of wage earners employed in March, 1937, being 17.3 per cent higher than the average number at work in March, 1936.

Real weekly earnings, or the purchasing power of wages, of workers in the manufacturing industries are also considerably higher today than in 1929. Actual weekly earnings averaged \$27.49 in March and were 3.7 per cent lower than the 1929 average of \$28.55. Since the cost of living in March, however, was 12.2 per cent lower than in 1929, real weekly earnings were 9.6 per cent above the 1929 level.

The average work week today is considerably shorter than in 1929. In March, 1937, the work week in manufacturing industries averaged 41.7 hr. This was 13.7 per cent less than in 1929 when it averaged 48.3 hr.

Scrap Institute Has New Chapter

A NEW chapter of the Institute of Scrap Iron and Steel was formed May 4 at the Hotel Taft, New Haven, Conn., to be known as the Southern New England chapter.

Officers elected at the meeting consist of the following: President, Charles O. McIntosh, West Hartford, Conn.; vice-president, Sidney Albert, Albert Brothers, Waterbury, Conn.; secretary-treasurer, Sam Kasden, H. Kasden & Sons, Inc., New Haven, Conn.

The Interstate Commerce Commission has granted applications of the New York Central and the New York, Chicago & St. Louis railroads to put into effect upon five days' notice after filing a rate of \$1.89 per gross ton on pig iron from Erie, Pa., to Butler, Pa., a reduction of 38c. under the present rate of \$2.07 maintained by these lines.